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PROCEEDINGS

Land Classification Conference

GREAT FALLS, MONTANA
JUNE 21-24, 1950

SPONSORED BY THE
COMMITTEE ON TENURE CREDIT AND LAND VALUES
OF
THE NORTHERN GREAT PLAINS AGRICULTURAL
ADVISORY COUNCIL
AND
THE FARM FOUNDATION CHICAGO, ILLINOIS

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The Farm Foundation
Chicago, Ill.

PREFACE

On June 21 to 24, 1950, a conference on Land Classification for tax purposes was held at Great Falls, Montana, sponsored by the Northern Great Plains Tenure Committee, with assistance from the Farm Foundation. The purpose of the conference was to discuss methods, procedures and principles for land classification for tax purposes. Work in progress in the Northern Great Plains states was reviewed in the hope that an exchange of ideas and information would assist in improving the work which is being done in land classification.

The conference program was arranged by a sub-committee composed of:

Norris J. Anderson, Nebraska	John Muehlbeier, Nebraska
D. M. Stevens, Colorado	Merton Otto, Kansas
Ralph Stucky, Chairman, Montana	

Members of the Northern Great Plains Tenure Committee, which sponsored the conference are as follows:

Max Myers, Chairman, South Dakota State College
Joseph Ackerman, Farm Foundation
Rainer Schickele, North Dakota Agricultural College
Obed Wyum, North Dakota Farmers Union
Charles Marshall, Nebraska, Farm Bureau
Norris Anderson, College of Agriculture, University of Nebraska
John Muehlbeier, Bureau of Agricultural Economics, Nebraska
Aaron Nelson, Farm Credit Administration
George Montgomery, Kansas State College
Dell Stevens, Colorado A & M College
Dean Vaughan, University of Wyoming
Layton S. Thompson, Montana State College
Mont Saunderson, U. S. Forest Service

The Northern Great Plains Tenure committee is a committee of the Northern Great Plains Agricultural Advisory Council. The Advisory Council is composed of the directors of the Agricultural Extension Services and Agricultural Experiment Stations of Kansas, Montana, Nebraska, North Dakota, South Dakota and Wyoming and representatives of agencies within the United States Department of Agriculture which are directly concerned with the advancement of the agriculture of these states.

The editing committee which was put in charge of arranging these proceedings and having them printed was composed of the following persons:

Bruce L. Brooks, Montana Extension Service, Conference Secretary
Ralph Stucky, Montana Extension Service, Conference Committee Chairman
Layton S. Thompson, Montana Agricultural Experiment Station

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LAND CLASSIFICATION SPECIALISTS - Pictured above are six of the men taking an active part in the land classification conference. Standing, left to right, are: Baldur Kristjanson, agricultural economist, North Dakota Agricultural College; Otto Wagnild, Montana state board of equalization field supervisor, and Dr. R. W. Simonson, principal soil scientist of the division of soil survey. Seated, left to right are: John Muehlbeier, from the bureau of agricultural economics, Lincoln, Neb.; Dr. J. G. Steele, soil scientist for the soil conservation service, and Brett Gray, chairman of the Colorado agricultural planning committee from Denver.



LAND CLASSIFICATION CONFERENCE - Five of the participants in the four day land classification conference. Left to right, they are: W. B. Middlemist, Denver, of the state tax commission of Colorado; G. A. Johnsgard, Fargo, of the soil department of the North Dakota Agricultural College; N. J. Anderson, Lincoln, of the Nebraska College of Agriculture, H. R. Stucky, Bozeman, extension economist of the Montana extension service, and Joseph Ackerman, Chicago, representative of the Farm Foundation. The conference is sponsored by the Northern Great Plains tenure committee with assistance from the Farm Foundation.

LIST OF THOSE PRESENT AT LAND CLASSIFICATION CONFERENCE
Great Falls, June 21-24, 1950

Joseph Ackerman	Farm Foundation, Chicago 5, Illinois
Norris Anderson	College of Agriculture, Nebraska
N. E. Beers	Asst. Director, Montana Ext. Serv., Bozeman, Mont.
Russell L. Berry	Ag. Econ. Dept. S. D. State College, Brookings, S.D.
Don R. Bosley	Montana Farmer-Stockman, Great Falls, Montana
Bruce L. Brooks	Extension Marketing Specialist, Montana Ext. Ser.
Mary S. Carroll	United Press — I. N. S.
T. S. Coile	Duke University, Durham, North Carolina, U. S.
James Dellroo	Forest Service, Missoula, Montana
M. O. Edwards	Teton County Assessor, Choteau, Montana
W. E. Engstrom	Teton County Commissioner, Collins, Montana
Vern Engelhorn	Land Reclassification, Cascade County, G. Falls, Mont.
Theodore Fosse	Doane Agricultural Service, Ames, Iowa
R. E. Frost	County Extension Agent, Great Falls, Montana
L. F. Gieseke	Cascade County Commissioner, Great Falls, Montana
Virgil Gilman	Soils Dept. Montana Ag. Exp. Sta., Bozeman, Montana
William Gough, Jr.	U.S.D.A., Extension Service, Washington, D. C.
Brett Gray	Chief Ad Valorem Tax Division, State of Kansas
Allan Hanson	Colorado State Agricultural Planning Commission
John A. Hopkin	Hill Co. Land Classification, Havre, Montana
G. A. Johnsgard	Ag. Econ. Dept. University of Wyoming, Laramie
William Gough, Jr.	Soils Dept., North Dakota Ag. College, Fargo, N.D.
Raymond Kelly	County Agent, Choteau, Montana
M. M. Kelso	Montana State College, Bozeman, Montana
Baldur H. Kristjanson	Ag. Econ. Dept., N.D. Ag. College, Fargo, N. D.
Quentin W. Lindsey	Ag. Econ. Dept. Lincoln, University of Nebraska
W. B. Middlemist	Colorado Tax Commission, Denver, Colorado
John Muehlbeier	Agricultural Economics, Lincoln, Nebraska
K. F. Myers	Soil Conservation Service, Great Falls, Montana
Clyde McKee	Director, Montana Ag. Exp. Sta., Bozeman, Montana
Kenneth L. Norman	J. M. Cleminshaw Company, Cleveland, Ohio
Alden E. Orr	Bureau of Reclamation, Great Falls, Montana
Merton L. Otto	Econ. and Soc. Dept., Manhattan, Kansas State Col.
Merton D. Proctor	Cascade County, Montana Reclassification, G. Falls
R. F. Rasmussen	Hill County Extension Agent, Havre, Montana
Harold Shane	Chairman Township, Cascade County, Montana
Ray Simonson	U.S.D.A. Soil Survey, Beltsville, Maryland
J. G. Steele	Soil Scientist, Soil Cons. Serv. Washington, D. C.
Delwin M. Stevens	Colorado A & M College, Econ. Dept. Ft. Collins, Col.
Ralph Stucky	Extension Economist, Montana Extension Service
Layton S. Thompson	Montana Experiment Station, Bozeman, Montana
R. B. Tootell	Director, Mont. Ext. Service, Bozeman, Montana
Otto Wagnild	Field Supervisor, Helena, Montana
B. H. Williams	Division Soil Survey, U.S.D.A., Lincoln, Nebraska
E. F. Woodard	Field Representative, State Tax Com., Lincoln, Neb.

LAND CLASSIFICATION CONFERENCE PROGRAM

Great Falls, Montana
June 21-24, 1950

Sponsor: This conference is being sponsored by the Northern Great Plains Tenure Committee, with assistance from the Farm Foundation.

Purpose: To discuss methods and procedures in land classification for tax purposes.

Objective: The objective is to review the work now in progress in each state. No attempt will be made to attain uniformity of methods among the various states. We are trying to explain the methods and problems of each state, hoping thereby to learn from each other the methods which may improve our work and eliminate mistakes.

Program

Wednesday, June 21 -

Chairman for the day - Norris Anderson, Nebraska

Introduction

Joseph Ackerman, Farm Foundation, a national survey of land classification methods, experiences and problems.

State Reports - (one hour for each state)

led by - Colorado	D. M. Stevens
Kansas	Merton Otto
Nebraska	Quentin Lindsey
N. Dakota	Balder Kristjanson
S. Dakota	Russell Berry
Wyoming	John Hopkin
Montana	Ralph Stucky

Thursday, June 22 -

Chairman for morning session - D. M. Stevens, Colorado

State Reports - continued.

Hill County - R. F. Rasmussen, Hill County Agent, Alvin Hanson in charge of classification for Hill County.

Cascade County - Harold Shane, Chairman of County Planning Committee

Theodore Fosse - County Agent in Charge for afternoon

Field Trip - Theodore Fosse, Cascade County Agent, L. F. Gieseke in charge of Soil Surveys, Montana State College, and B. H. Williams, Soils Coordinator for Montana and Colorado - U. S. Bureau of Soils.

Friday, June 23 -

Chairman for morning session - Ralph Stucky, Montana

Otto Wagnild, Field Man, State Board of Equalization. The use of land classification on a productivity basis to get equitable tax assessments.

R. W. Simonson, Prin. Soil Scientist, Division of Soil Survey. The importance of soils surveys in the land classification program for tax purposes.

J. D. Steele, Soil Scientist, Soil Conservation Survey Division, SCS. The use of the land use capability maps of the Soil Conservation Service in the classification of land for tax purposes.

M. M. Kelso, Montana State College, general principles involved in classifying land on a productivity basis for tax purposes.

Chairman for afternoon session - Baldur Kristjanson, North Dakota

Discussion session on:

- a. General principles of land classification-led by Joseph Ackerman, Farm Foundation.
- b. Basic information needed in Land Classification worked by John Muehlbeier.

Educational program needed and how to get the people to take part in the program - led by Brett Gray, Colorado Planning Commission.

Saturday Morning, June 24 -

Chairman - Layton Thompson, Montana

Ben Middlemist, Colorado State Tax Commission, Considerations in the valuation of land classified on a productivity basis.

Discussion

V. A. Engelhorn, Chief Appraiser, Doane Agricultural Service. What to consider in valuation of farm buildings in relationship to the classification and valuation of land.

Discussion

Adjournment

LAND CLASSIFICATION METHODS, EXPERIENCES, AND PROBLEMS

Joseph Ackerman
Associate Director, Farm Foundation, Chicago

There is much confusion in our thinking with respect to the theory of land classification. It is hoped that this conference will provide an opportunity for an exchange of ideas which will help to clarify some of our thoughts and to improve our work in land classification for tax purposes.

Before discussing the program of the various states, perhaps it would be well to take a look at some of the general land classification methods, experiences, and problems. There have been many methods and techniques used in classifying land. Likewise there has been an increasing number of ways of using land classification for various purposes. As land classification developed in the United States, it was concerned with many activities. Some kinds of land classification were used to guide the disposal and use of the vast public domain. Much of the early work was done in unsettled areas, previously unmapped, with the thought that classification would help to determine the proper settlement and use of the land. It was not until the beginning of the 1900's, when soil surveys and topographical mappings came into the picture, that serious attempts were made to classify land on sound scientific principles. Later on, economic classification began to take place and an attempt was made to analyze the productivity of the land.

Land Classification Definitions and Purposes

In the first national conference on land classification held in Columbia, Missouri, in 1940, it was pointed out that many of the differences of opinion concerning land classification are due to a lack of common definitions and are easily resolved during informal discussions that get down to cases.¹ Kellogg and Albeiter say that land classification implies the development of a logical system for the arrangement of different kinds of land into defined categories according to the characteristics of the land itself.² But in land use planning, land classification is understood to mean the placing of bodies of land into classes which are described in terms of their use-capabilities.³

¹See Proceedings of the First National Conference on Land Classification, Missouri Agr. Experiment Station Bulletin 421 (Columbia, December, 1940), p. 7.

²See C. E. Kellogg and J. K. Albeiter, "A Method of Rural Land Classification," U. S. Dept. of Agriculture, Technical Bulletin 469 (Washington, 1935), p. 4.

³See C. P. Barnes, "Land Classification: Objectives and Requirements," U. S. Resettlement Administration, Land Use Planning Publication No. 1 (Washington, mimeo., February 1936), p. 1.

The following definition and purposes of economic land classification were stated by a committee appointed to summarize a discussion which began at the 1946 Western Farm Economic Association meeting and was continued at Corvallis, Oregon, in 1948. "Economic land classification is a technique used to express, usually cartographically, integrated and correlated physical, economic and social data common to selected areas. These data, characterizing delineated land areas, may be used in a wide field of divergent subject matter. Many of these applications have had the objective of making wise decisions about land and its use.... An economic land classification may be a general purposes classification, that is, it may serve many purposes.... On the other hand, economic land classification may be designed to serve a special purpose. The planning of irrigation, drainage, flood control and soil conservation projects may require highly specialized types of economic land classification. Creditors desire a classification based upon present incomes, farm and nonfarm. Planners want the basic physical and economic data presented, with or without the classification. Frequently they desire an interpretation in terms of potential conditions. Extension workers need economic information which is applicable at the farm level. For such purposes economic land classification must be performed in sufficient detail to be useful to small groups, and, to a limited extent, to individual farms if it is to serve the needs of extension programs. Land class maps prepared for one specific purpose may be modified, in some cases, so as to be useful for other purposes."⁴

It becomes clear, therefore, that the successful development and application of any technical system of land classification requires a clear understanding of the problems for which the classification is needed.

A National Resources Planning Board report in 1941 stated that land classification activities in the United States fall into the following five categories, each representing a distinct type of land classification:

- Type I Land classification in terms of inherent characteristics
- Type II Land classification in terms of present use
- Type III Land classification in terms of use capabilities
- Type IV Land classification in terms of recommended use
- Type V Land classification in terms of program effectuation⁵

Such a division does much to clarify the field of land classification by providing a frame of reference in which each phase can be discussed.

Land Classification for Tax Purposes⁶

However, this conference is concerned with land classification as an aid in real estate assessment. For almost half a century interest in land classification for the purpose of tax assessment has been a subject of recurring importance in many states. The greatest interest and activity has been in states which place reliance upon property taxes as a means of revenue. Our tax system is based upon the principle that our farmers, as

⁴David Weeks, K. S. Landstrom, and C. V. Plath, "The Corvallis Land Classification Conference," Land Economics, 26:181 (May 1950).

⁵"Land Classification in the United States," Report of the Land Committee to the National Resources Planning Board (Washington, Gov't Print. Off., 1941), p. 3.

well as other individuals, should be taxed according to their ability to pay. It was generally conceded that the best measure of ability to pay was the amount of property owned, and for that reason property taxes were widely adopted. Because of the variation in the productivity of the land, and because of the difficulty of proper assessment, it is necessary periodically to try to develop better techniques for levying property taxes.

Some people continue to believe that those who own landed property should pay more than those who receive service income because land owners receive more benefit from the government. However, experience indicates that if the major base for local taxation is to be real estate, it is necessary to find more equitable means of assessment and to bring about a better means of evaluating land. It is generally conceded that land classification is a procedure by which much of the inequity that now exists could be eliminated.

A committee appointed by the International Tax Association (later, the National Tax Association) in 1909 recommended that classification of rural lands should fall into one of eight basic classes: (1) cultivated land, (2) arable land (land not under cultivation but suitable for plowing), (3) orchard land, (4) timbered land, (5) mineral land, (6) quarry land, (7) oil and gas land, and (8) waste land, into which all land not included in one of the other seven classes is placed.⁷

R. R. Renne stated that "The first requirement for a good soil survey and land classification for assessment purposes is that it furnish the basis for determining the long-time productivity or normal values of the land in terms of the yield of the predominant crop... A second requirement of a good soil survey and land classification, to be useful for assessment purposes, is that it must be sufficiently detailed, complete, and accurate to meet the legal requirements for assessment purposes.... A third important requirement of land classification for assessment purposes is that the grades of land determined for different types of land be sufficiently clear and meaningful to make it possible to determine readily the grades which are submarginal for certain types of utilization and the grades which are distinctly above the margin."⁸

Many studies indicate that there is a need pointing toward the revision of assessment methods because of great inequalities that exist between

⁶For a discussion of recent land classification activities in several states, see S. L. Crockett, "Status of Land Classification for Tax Purposes," Agricultural Economics Research, 2:23 (January 1950).

⁷For a more detailed discussion of the committee's report, see International Tax Association Fourth International Conference on State and Local Taxation, Proceedings, 1910, p. 335.

⁸R. R. Renne, "Land Classification as an Aid in Real Estate Assessment," in Proceedings of the First National Conference on Land Classification, Missouri Agr. Expt. Sta. Bulletin 421 (Columbia, 1940) p. 84-88.

various grades and types of land under the methods used by most assessors today. Our studies of appraisal indicate that poorer grades of land are overvalued and better grades undervalued. It has also been demonstrated by numerous studies that small holdings tend to be assessed comparatively more in sales value than large holdings. Studies of assessed values as related to productivity indicate also that poor grades of soils are assessed proportionately higher than better grades. Most of the statutes provide that real estate should be assessed at its full cash value, or that it shall be fair, or that land should be appraised at its true value in money. This means that assessors are asked to try to find a price that the land would bring at a voluntary sale at which there would be a willing buyer and a willing seller.

During periods of extreme fluctuation in income, particularly in periods of low income, it is obvious that assessments vary greatly. At such times land classification is held up as a means whereby certain categories can be set up in which land of similar productivity and use can be placed in similar categories. In arriving at a fair assessed value of land it is necessary to determine the ability of the farm to produce income and to try to find a value which is based upon the productivity of the land. It is desirable to separate the function of bringing together physical characteristics, which present potential productivity, from the process of valuation itself.

There are many other factors besides productivity which affect land value. The process of placing a value on the land becomes relatively simple if all of the material related to productivity is assembled. Frequently the productivity of the soil is the result of a combination of soil characteristics in relation to the system of soil management. Productivity can be expressed in terms of yields or quality of crops under various defined systems of management. Almost no soil is productive without some kind of management. It is, therefore, necessary to separate the human element from the physical.

Land classification itself should not be regarded as a substitute for careful appraisal of individual farms, but it should provide the basis by which a better individual appraisal can be made. Each individual farm unit within similar land classes will vary because of other factors which are related to value. Land classification can provide the basis for gaining a better understanding of normal earnings and land use within an area and can provide a basis for more equitable assessments.

GENERAL PRINCIPLES INVOLVED IN CLASSIFYING
FARM LAND FOR TAX PURPOSES

M. M. Kelso, Montana State College

Before listing the general principles that are involved in classifying farm land for tax purposes, we first should examine the underlying ideas from which these principles are derived. If we can agree on the fundamentals, we can agree rather quickly and easily on the principles. If we cannot agree on the principles, it is likely we will find the source of our disagreement in differing opinions relative to the fundamental propositions.

To begin with, then, let us examine briefly the fundamental propositions from which I derive the principles involved in farm land classification for tax purposes.

Proposition 1: The ultimate purpose of farm land valuation for tax purposes is to arrive at a value for each unit tract in an area (usually 40 acres) such that when the tax levy is applied to it, each tract of farm land will bear a share of the total property tax payment adjudged to be fair according to some agreed-upon criteria of fairness.

Proposition 2: A value of farm land based upon some measure of its income yielding potential is taken in our society as the chief criterion of fairness in real estate taxation. But farm land has no income yielding potential and, hence, no value apart from some setting it may have within a farm through which management is applied to its use.

Proposition 3: But farm land when valued for tax purposes is considered and valued apart from any specific, actual farm organization setting; it is valued at some figure in dollars per 40-acre unit with no explicit reference to its setting in any specified firm.

Proposition 4: As a result, we use some concept of a "usual type and size of farm" operated by a "typical" entrepreneur to evaluate farm land for tax purposes.

Proposition 5: The implication of the foregoing is that in valuing farm land for tax purposes, quality of management and type and size of farm are held constant over broad areas of generally similar environmental conditions and prices are held constant throughout the area at any given point in time. Thus the only variables that affect farmland values for tax purposes at any given time are factors associated with the yield expectancy of the land as customarily used in the area modified, however, by certain factors that may affect the significance of these yield expectancies to the "average operator." (Examples of such modifying factors are (1) the degree of yield variability around the "average yield expectancy", (2) the absence of stock water in an area, (3) the reliability and adequacy of irrigation water available to a tract, (4) the prevailing tenancy system in the area, (5) distance to and difficulty in getting to market, etc.)

If these propositions are accepted, then it seems to me the following general principles involved in classifying farm land for tax purposes follow logically:

1. The basic principle is that we start from an interpretation of the physical resource in terms of its production potential stated in long-time yield expectancy terms for specific uses. We place each 40-acre unit of farm land in its appropriate class defined in yield expectancy terms relative to each specific crop use.
2. It will be necessary to adjust the values of these basic classes (but see principle 6 below) to reflect geographic, physical or social factors critical in modifying the significance of the yield expectancy to our "usual operator on a usual farm." The influences of these modifying factors may, for some kinds of modifications, be allowed for in the classification process itself by setting up appropriate sub-classes.
3. The farm land classes thus developed must be uniform in definition, must be applied uniformly, and must be uniformly significant relative to farm land values throughout the political unit within which tax equalization is sought. (To illustrate, if class I cropland is defined as 24 bushel yield expectancy for wheat, and if equalization is sought as between farm lands throughout the State, then class I cropland must be defined as being 24 bushel wheat land throughout the State, 24 bushel wheat land wherever found within the State must be put in class I cropland, and 24 bushel wheat land (always placed in class I cropland) must be given the same value for tax purposes wherever it is found within the State, subject to the influence of modifying factors discussed above.
4. No individual operator shall be penalized or subsidized for the quality of his management or the type or size of his farm. Assuming usual or typical management and usual farm type and size assures the realization of this principle.
5. The classification must be geared to the sole purpose of providing significant data useful in equalizing land value assessments for taxation purposes. It may have many other incidental values, but these must be kept incidental and subordinate. Classifications established for other purposes should be critically analyzed before adopting them for use for tax assessment purposes to determine their usability for the latter purpose.
6. The classification must be kept distinctly separate as a procedure and as an inter-mediate goal from procedures for valuation and from valuation as the ultimate but subsequent goal.
7. Laymen--farmers, county officials, village residents--must participate in the classification process--first, for the knowledge and experiences they can contribute; second, for their complete understanding of the purposes, methods and meanings of the classification.
8. Quality measurements and terminologies used in the classifications must be such as to be readily and clearly understood by laymen. (The bushels per acre is preferable to the Storie Index, for example)

9. Classification must be so designed that it can be readily adjusted to changing physical and technological conditions, but it should be geared to factors that are relatively permanent in the environment.
10. The final classifications must be mapped and pertinent data underlying the classifications must be recorded and both maps and data made available to the taxing authority. The final classification maps must be posted conspicuously for public study and familiarization.

REPORT OF COMMITTEE OF THE CONFERENCE
ON
THE BASIC INFORMATION NEEDED TO CLASSIFY LAND
FOR
TAX PURPOSES

The committee considered its function to be that of suggesting types of information which may be helpful in the more precise classification of farm land for tax purposes.

To get at this job, we asked ourselves these questions: (1) What physical factors influence production? (2) What economic factors need to be considered in connection with classifying land for tax purposes? (3) What information will help in the delineation of area differences?

We suggest that one of the first steps necessary in this process is to characterize or describe the basic physical resource, particularly its quality or capacity to produce at stated levels of management. Capacity to produce is basic to classification for tax purposes.

Indications of capacity to produce can be obtained from several sources. Some of these are soil surveys, land use capability surveys (where the basic data used for the classification are available for interpretation), various AAA records, crop insurance experience, various yield data, carrying capacity surveys, various productivity ratings, yield histories, farmer experience and judgment, and numerous other sources. There is of course a certain interrelationship between many of these.

Some of the types of information listed will serve better than others to show the productive power of land. The more detail on quality of land, the easier the job of delineation; but there is no reason why all the different types of information should not be used, each adding whatever it can to the description of the quality of the land under consideration. It is necessary, however, to recognize any shortcomings in the data used, especially where some classification of land has already been made but for some purpose other than for tax assessment.

We also suggest that climatic data be considered along with the description of the physical resource. Likewise, land use is an important factor; and by now readily obtained for most areas from such sources as soil surveys, capability surveys, or AAA photos.

In inventorying the capacity of land to produce, we feel it essential that the level of management assumed be rather clearly defined. That will help with interpretations and understanding of the data.

Under certain conditions, location of land with respect to shipping points or roads, the water supply, and accessibility of the land need to be considered. Certain production hazards or yield expectancies also are important factors. From the long-time point of view, we need to know under what conditions land can be expected to continue to produce.

Last, but not least, we suggest that the full participation of local people be sought, not only to gain acceptance, but to tap that large reservoir of experience with getting production from the land. This can add much to the description of the quality of the land not otherwise obtainable.

Prepared by

N. J. Anderson, Nebraska
G. A. Johnsgaard, N. Dakota
Virgil Gilman, Extension, U.S.D.A.
John Muehlbeier, BAE, chairman

THE FUNCTIONS OF SOIL SURVEYS IN A LAND CLASSIFICATION
PROGRAM FOR TAX ASSESSMENT

Roy W. Simonson, Assistant Chief, Division of Soil Survey ¹

The use of soil classification in tax assessment goes back a long, long way. There is evidence that the Chinese used a scheme of soil classification in determining tax levies and the size of holding some 4,000 years ago (10).² In fact, considerable impetus to the development of soil science as an independent branch of learning was provided by work in land classification to improve tax assessments of rural lands in Nishni-Novgorod during the eighth decade of the last century (14). Yet I thought that we were pioneering when we first made a soil survey and later prepared a land classification for tax assessment in McKenzie County, North Dakota some 15 years ago (8). Since then I have learned that soil classification and soil maps have been used in tax assessment in a number of countries since the Chinese practiced it so long ago.

Elements of Land Value

During our land appraisal schools for bankers in Iowa some 10 years ago, we used to say that the value of agricultural land was like a three-legged stool. The three legs on which the stool rested were productivity, price, and place. This analogy is useful as a starting point for discussion. The capacity of the land to produce is obviously of the first importance in determining land value. Other things being equal, soils that will produce 20 bushels of wheat per acre are clearly worth more than soils that will yield 10 bushels. The prices of the products a farmer sells are important in determining the general levels of land values. Witness the differences in land values in the Northern Great Plains now as compared to those of the middle 1930's. Finally, place has meaning in determining accessibility, distance from schools, location with reference to markets, and the like. I can remember 20 acres of Morton loam in McKenzie County, North Dakota that would have been productive under cultivation but the area lay atop a butte rimmed by sandstone crags. Machinery and crops would have had to come and go by packhorse or helicopter. The area was used as grazing land, and no one thought of trying to cultivate it. These few examples are simply intended to highlight the importance of the three elements of productivity, price and place to the value of agricultural land. Other facts such as the kind and quality of improvements, the size of farm, and the current tax rates on land must also be considered in land appraisal (9).

Among the several elements that go into land value, productive capacity is directly related to soils. The prices of products are independent of the nature, distribution, and behavior of soils. The location with respect to markets and schools, the nature of farm improvements, and the

¹Assistant Chief, Division of Soil Survey; Bureau of Plant Industry, Soils, and Agricultural Engineering; Agricultural Research Administration; U. S. Department of Agriculture.

²Numbers in parentheses refer to literature cited at the end of the paper.

size of farm must also be evaluated independently. There is some significance at times in the pattern of soils. On the whole, however, the nature, distribution, extent, and behavior of soils are important in land valuation because of their importance to the present and future productive capacity of the land (6) (9).

Nature of Modern Soil Surveys

Before we discuss the applications of soil surveys in land classification for assessment, let us take a look at the nature of the surveys themselves. The present basic soil surveys are designed (a) to determine the important characteristics of soils, (b) to classify soils into defined types and phases, (c) to establish and plot on maps the boundaries among soils, and (d) to predict the adaptability of soils to various crops, grasses, and trees; their behavior and productivity under different management practices; and the yields of adapted crops, grasses, and trees under defined management systems (7) (11). The fundamental purpose of the soil survey, like that of other research, is to make predictions. In order to have sound predictions, however, it is necessary to accumulate a considerable body of knowledge about soils.

The principal mapping units in current detailed soil surveys are soil types and phases. These units are geographic bodies. Each area of a soil type or phase is a small segment of the land surface extending downward into the earth for a few feet. Thus, each is a solid, with an obvious and usually irregular surface, an indistinct lower boundary, and an evident but not sharply defined perimeter. Each soil type includes a large number of individual profiles (vertical sections down through the soil to a depth of several feet), all of which occupy points on the land surface. Each soil type is also a product of a unique combination of climate, living organisms, parent materials, topography, and time, often modified by man. Wherever a given combination of the factors of soil formation occurs, the soil type will be the same. This is of the first importance in the making of predictions about soils and their behavior. It provides us with an opportunity to establish a uniform system of classification and nomenclature that will permit the transfer of knowledge gained through research and experience in one place to similar soils in other places, whether those be in the same country or in different continents (7) (11).

Soil types and phases are defined in terms of soil properties, both internal and external, which are considered collectively. Major emphasis is given to the soil profile, including its various horizons, because the profile is a reflection of the factors of soil formation, is important to the growth of plants, and has significance to engineering uses of soils. Characteristics considered in the definition of soil types and phases are directly observable or are inferred from observable features. The principal observable features considered are the number, thickness, and arrangement of horizons in a profile; the color, texture, structure, consistence, and reaction of each horizon; the contents of carbonates and soluble salts in the soil; and the slope, stoniness, parent material, and underlying rock. The principal inferred properties considered are natural drainage, contents of organic matter, fertility levels, permeability, and degree of erosion.

These features, and occasionally others, are all weighed together in the definition of individual soil types and phases, which are kept to the minimum consistent with sound classification in each area covered by soil survey. All properties must be considered jointly and in their relationships to one another in the definitions of the classes, whether those classes be soil types, phases, or great soil groups.

The field mapping and associated research answer the first three purposes of the modern soil survey. From these studies come the determinations of important characteristics of soils, the classification of soils into types and phases, and the map showing their distribution and extent.

To answer the fourth purpose of the modern soil survey, the behavior of soils under different methods of handling must be determined. Predicting the yields of crops, grasses, or trees or the long-time effects of management practices on the soil cannot be accomplished from the knowledge of the nature, extent, and distribution of soils provided directly by soil surveys. Additional sources of information must be drawn upon to determine the behavior of soils.

Estimating Soil Productivity

Productivity depends upon soil and management. Almost no soil produces without some kind of management, though the latter may be simple indeed. Some soils are highly productive when first plowed, whereas others are made productive under cultivation. Soils of the latter kind are common in the eastern and southern parts of the United States. In estimating productivity, some use such as grazing, cropping, or forestry must be assumed together with the level of management. Even having fixed upon a type of farming, the principal crops, and the level of management, there is still a big job in making reliable estimates of productivity.

Estimates of soil productivity are based on farm experience, on research, or both. Possible sources of information are the memories of farmers, farm records, data from experimental plots and fields, sample yields, and data from agricultural adjustment programs (12). Several different sources are commonly used in the making of careful estimates. The major source of information in the past has been farm experience, interpreted largely by observation.

As one effort to provide better information, productivity ratings for soil types and phases were introduced into soil survey work about 20 years ago (2). Several notations have been used to express soil productivity. The best soils were rated "1" and the poorest ones "10" in the system used in Illinois (13) and in some federal soil survey reports (2). "Crop productivity indexes" expressing the probable yield of each crop as a percentage of a standard have been used widely in the publications issued by the Division of Soil Survey, U. S. Department of Agriculture since 1934 (2). During the first few years of their use, the ratings were to express "inherent productivity," but that practice was largely dropped when soil scientists recognized more clearly that productivity depends upon soil and husbandry.

At the present time, estimates of yields of different crops and of carrying capacities for range and pasture are prepared in the course of soil surveys. Some of the more recent published reports (1) (5) carry productivity ratings or yield estimates for the soil types and phases under 2 or 3 defined levels of management. These levels of management are intended to represent (a) the common practices of successful farmers in the area, (b) the methods followed by outstanding farmers, and (c) the best methods now known through the research of the experiment stations, federal organizations and others. For the most part, the ratings or yield estimates provided are of the first and second kinds listed. This type of information should be useful indeed to a land appraiser or tax assessor who is concerned with the value of a ranch or farm. It provides a synthesis in a single figure for each soil of the knowledge gained through much experience and research.

Along with the preparation of productivity ratings as a regular part of current soil surveys, research is going forward to provide better bases for estimating yields and for defining management systems. Studies of long-time farm records in Illinois have shown that corn yields can be predicted with a high degree of accuracy if the soil type and the management are both known (13). Similar work is now under way in Iowa. Generally speaking, the use of the farm records is feasible where fields commonly include two or at the most three different soils. The interpretation of farm records promises to be perhaps the simplest approach in improving the basis for yield estimates by soil types and phases wherever it is feasible. Other methods will have to be devised, such as the taking of sample yields (12), in places where the use of records is impractical for one reason or another. Even at best, however, much of the job of estimating soil productivity will depend upon the powers of observation of the men concerned with identification and mapping of soils, with land valuation, with farm management, or with research in soil management. As the basis for estimating productivity is improved, the opportunities for better land valuation will also improve.

Land Classification for Tax Assessment

Following the discussion of soil surveys and soil productivity, let us go back to the idea of land value as a three-legged stool resting on productivity, price, and place. Modern soil surveys provide information that is important chiefly to the one leg -- determining the productive capacity of the land. They furnish the best available basis for reliable estimates of future production and for comparisons of different tracts of land. Even so, interpretations are required in the effective use of the information.

A program of land classification for tax assessment must deal with geographic units of land held as property. These may be quarter sections, sections, or parts of these units. They may also be lots defined by metes and bounds. In nearly all cases, the property boundaries can be defined in terms of latitude and longitude rather than in terms of natural features. Sometimes a property boundary and a natural feature such as a shoreline coincide, but this is not common. Consequently, agricultural properties considered by the tax assessor commonly consist of several soil types and phases. Interpretations of the probable productivity of the property must

take this fact into account. Methods have been devised and used in land classification for tax assessment (6) (8) for estimating the production from each of the soils within a tract and then getting a sum for the whole.

Although the principal information furnished by soil surveys for use in land appraisal is that on productivity, other useful data may also be provided. The size of individual areas of soil types or phases and their distribution pattern may be very important to their possible usefulness. There commonly are areas of soils too small to be useful for cultivation scattered throughout grazing lands. Or there may be many small spots of soils entirely unsuited for cultivation widely distributed in large bodies that would otherwise be productive of crops. The possible uses of individual tracts may thus depend upon the pattern or the sizes of individual bodies of soils, information which can be obtained from soil surveys.

One last word about the function of soil data in land classification. As a rule, the kinds, distribution, extent, and behavior of soils are important elements in land classification, whether it be in terms of agriculture, forestry, or engineering. A land classification significant to agriculture, for instance, must be made with reference to some type of farming, to a certain state of agricultural technology, and to a defined price structure. These considerations may be more important than the soils in determining the proper classification of the land. Consequently, data on many things other than soils are important in agricultural land classification. The kind of data that are necessary will differ according to the purpose of each land classification, but many land classifications may be derived in part from the information provided by modern soils surveys.

Usefulness of Published Soil Surveys

Much of my discussion on the functions of soil surveys in land classification for tax assessment has dealt with the soil surveys now in progress or made in recent years. Most of those that are available in published form, however, were made some years ago. More than half of the published soil surveys are 25 or more years old. Perhaps some remarks on their possible usefulness in land classifications would be helpful.

The first soil surveys in the United States, made 51 years ago, provided rapid coverage and simple maps (11). Despite the improvements in transportation since 1899, the field men then covered at least 10 times the area per man-day that we now try to cover in our soil surveys. The total number of units defined and mapped was about 5 percent of what it would be now in the same area. The published maps, mainly on a scale of 1 inch per mile, carry less than 10 percent of the miles of soil boundaries to be found on the maps now being prepared at scales 2 to $2\frac{1}{2}$ times as large. The changes in the nature of soil surveys have come about gradually as the body of knowledge about our soils has slowly grown. As a consequence, the published soil surveys range in character all the way from those with the very simple maps made 50 years ago to those with the highly detailed maps of today (see Grainger County, Tennessee) (5). Furthermore, a number of the surveys have been of a reconnaissance nature, such as the one made in northern Montana (3). Considerable interpretation is necessary with many of the published soil surveys, and many, especially the older ones, will be of

limited usefulness in estimating productivity or in determining use-suitability. The published soil surveys have been used widely in land appraisals in the past, however, and can be helpful wherever better data are not now available. Methods for using the information provided by the reconnaissance survey of northern Montana in land classification for tax assessment have been suggested in a bulletin of the Montana Agricultural Experiment Station (4). Similarly, other soil surveys that do not provide all information on the nature, distribution, extent, and behavior of soils necessary in a land classification program for tax assessment can be helpful when the proper interpretations are made from them. Like any instrument, their usefulness depends in part upon the user. As with a camera or a bulldozer, the results obtained depend upon the skill and knowledge of the user quite as much, and often more, than they do upon his tools.

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USE OF LAND-CAPABILITY MAPS OF THE SOIL CONSERVATION SERVICE
IN CLASSIFICATION OF LAND FOR TAX PURPOSES

By J. G. Steele, Soil Scientist, Soil Conservation Service

Physical facts about land, interpreted in the land-capability classification, are used by farmers and ranchers and by technical men who help them select land uses and apply conservation practices that fit their own exact land conditions. It is to be expected that the same physical land facts that are used in soil conservation work would be useful in classifying land for tax assessments.

Variations in physical properties of land are easily recognized by farmers as well as by professional workers. Differences in depth of soil, texture, water-holding capacity, permeability, organic-matter content, and supply of mineral nutrients all affect the productive capacity. Variations in slope of the land, in position of the water table, in the risk of flooding on bottom land, and in the rate of accumulation of soluble salts affects either the stability of land while it is used, the risks of crop failure or damage, or both. Duration of growing season, prevailing temperatures, amount and distribution of precipitation and velocity of wind are significant climatic factors. Some of these factors, such as position of the water table, must be observed over a period of time to learn the significant fluctuations. Some of the significant land characteristics, such as permeability of the subsoil, cannot be observed or measured directly at enough locations for practical and rapid land classification, but must be inferred in part from visible clues.

A soil scientist who is sufficiently skilled can map the basic land features that have been found to be significant in farm or ranch operations, and can assist in interpreting the basic features in terms of land capability for crop production and other land uses. The map of basic land facts that is made for use in planning conservation work on farms and ranches is called a soil conservation survey map. A soil conservation survey map that is colored or otherwise interpreted in terms of the land-capability classification is called a land-capability map.

Land-capability maps based on physical land facts are in use in the more than 2000 soil conservation districts that now receive technical help from the Soil Conservation Service. Each farmer or rancher receives a land-capability map of his land along with his conservation plan. The mapping done in these districts to date amounts to 322 million acres, and it is being added to at a rate of nearly 30 million acres per year. In the seven States that are represented in this conference about 45 million acres have been mapped to date. Much of the mapping is on scattered farms or groups of farms in order to keep pace with conservation planning. In a number of districts, however, mapping has been done in good-sized blocks. The maps that have been made are available for consultation for purposes such as land classification. They are not published except in rare instances, but can be consulted in the field offices where they are located. A soil scientist, designated as the State soil scientist of the Soil Conservation Service and usually located at the Agricultural Experiment Station, is responsible for mapping legends and for technical supervision of surveys in the State. He can also furnish information about the area covered in each soil

conservation district. All specifications for mapping are worked out in cooperation with the State Agricultural Experiment Station and in consultation with members of other interested agencies such as the Bureau of Plant Industry, Soils and Agricultural Engineering, and the Bureau of Reclamation.

The land-capability classification is a convenient organization of physical facts about land. On soil conservation surveys the basic physical land facts are recorded by outlining land-mapping units, each identified by symbols that show the kind of soil, described precisely in terms of depth, texture, permeability, and other characteristics; the steepness of slope; the kind and degree of erosion; and other physical factors if they are significant. The land-mapping units that are closely similar are grouped together, for purposes of recommending land uses and requirements, into land-capability units. A land-capability unit contains the bodies of land within a climatic zone that are closely similar in characteristics that affect erosional behavior, water management, crop adaptations and responses, and conservation needs under a given system of use. Land-capability units are grouped for some purposes into land-capability subclasses, of which as many as four may be recognized within one land-capability class. Subclasses are then grouped into the eight land-capability classes; and the eight classes may be grouped if desired into two general groups, land suited for cultivation and other uses, and land not suited for cultivation but suited as a rule for grazing, forestry or wildlife.

The soil scientist who maps the basic land facts makes use of a mapping legend that specifies clearly the soil variations, slope classes, erosion classes, and other physical land factors that are recognized in distinguishing mapping units. Such a mapping legend must be made up by people who are experienced in judging significance of these features in the locality in connection with land use, crop responses, water management, conservation needs, or other requirements. The soil scientist as he observes and maps the land must have constantly in mind the relations among the various physical factors that he identifies and the significance of them in connection with land use and land capability. Both the original determinations of significant land separations to be recognized as mapping units and the later placement (after some mapping has been done) of the physical land conditions into land-capability units, subclasses, classes and general groups, must be done by several people working jointly. The accumulated experience of soils men, agronomists, farm-management specialists, conservation planners, range men, foresters, and others, along with the experience of practical farmers and ranchers must enter into both the determination of significant physical land-mapping units and the land-capability classification.

The most general grouping in the land-capability classification is a separation of land suited for cultivation from land not suited for cultivation. Land suited for cultivation is also suited for one or more other uses such as grazing, forestry, and wildlife. In determining overall suitability for cultivation, it is assumed that: (1) tillage and harvesting operations will be done with machinery; (2) land will be classified as suited for cultivation only if it can be cultivated for a long time without significant damage under some appropriate system of management; and (3) land will be classified as suited for cultivation only if it is likely to yield a reasonable return. Physical characteristics that make land difficult to manage, such as stones or heavy texture, are considered in the classification

along with those that affect permanence of land. "Cultivation" as used in connection with land capability means regular disturbance of soil in preparation for annual or short-lived perennial crops. Disturbance of some land not suited for cultivation is justified in order to establish desirable perennial vegetation, even though some risk of erosion is incurred while vegetation is being established.

It should be re-emphasized that climate is considered along with other physical land characteristics in the land-capability classification.

The eight land-capability classes are distinguished according to the degree of limitations in cultivation or other land use, or risks of land damage that are imposed by physical land characteristics. Sloping land, for example, is subject to more limitations in safe, sustained use than level land if other factors are equal. A soil with low available moisture capacity is more limited than one that holds adequate moisture. Stones, shallow soils, impervious layers, sloping or steep topography, excessive wetness, and inadequate amount or distribution of precipitation are some of the common physical land conditions that limit land use or land permanence. The land that is most favorable with respect to physical characteristics and subject to few or no limitations in safe, long-time use is designated as class I land. Classes II and III contain the land subject to moderate limitations and severe limitations, respectively, for cropland use, because of physical characteristics, but suited for regular use in crop production with necessary precautions. Class IV is defined to consist of the land suited for cultivation occasionally, as in a long rotation that includes several years of hay, or in some other limited way.

Class V land is unsuited for cultivation because of one or more permanent factors such as stoniness or wetness, but has few limitations for grazing or for woodland use. It is not extensive except in certain areas of wet land. Land in classes VI and VII is not suited for cultivation, and is suited for grazing or forestry with moderate limitations and with severe limitations, respectively. Class VIII land is so severely limited by its physical characteristics that it cannot be used safely for cultivation, grazing, or forestry. Much of it is at least fair wildlife land, some is useful watershed land, and some class VIII land is good scenery.

The eight land-capability classes are indicated by standard colors on maps and publications. Class I land is shown by green, and classes II, III, and IV by yellow, red, and blue, respectively. Class V land is shown by dark green, class VI by orange, class VII by brown, and class VIII by purple.

Most of the land-capability classes may contain as many as four subclasses, distinguished according to the dominant kind of limitation in land use that is fixed by the physical land features. The eight land-capability classes, as has been stated, are distinguished from each other according to the degree of limitation. To illustrate the four possible subclasses, we may have within class III land which is land subject to severe limitations in use as cropland, one or more of the following subclasses: Land that is moderately sloping so that its safe use is limited chiefly by danger of erosion (subclass e); land subject to excess water

because of flooding or high water table (subclass w); land limited chiefly by unfavorable soil characteristics, such as shallow or sandy soil (subclass s); and land limited chiefly by precipitation not adequate in amount or distribution (subclass c).

Usually not more than 2 or 3 subclasses will occur in any of the land-capability classes within one county or soil conservation district. Subclasses are not recognized in class I and the e subclass (subject to erosion) is not recognized in class V.

Significant variations in the land within one land-capability class and subclass make up different land-capability units. A land-capability unit consists of the mapping units that are nearly alike in physical characteristics, crop adaptations, and responses to treatment. Usually it is to be expected that the land-capability units defined in a county or a soil conservation district will furnish adequate detail for classification of land for tax purposes. If more detail is desired, the necessary information can be obtained from the basic land-mapping units, each of which is identified on the maps in terms of soils, slope classes, erosion classes, and other significant physical factors. It is to be expected generally that each land-capability unit in a given area will have a characteristic productive capacity under a given type and intensity of management.

Ellsworth County, Kansas, is one area in which land-capability maps of the entire county will be provided for reference along with descriptions and other information about each land-capability unit. After study of the land conditions, the land-mapping units shown in the county were grouped into 35 land-capability units. The following are examples of two of the land-capability units:

One land-capability unit consists of sloping, eroded, deep sandy soils of moderately low fertility. Mapping units are 8-0/B-2, 79/B-1 and 79/B-2, the symbols designating soil/slope-erosion. This is class III land, severely limited for cropland use, and subclass IIIe, subject to erosion. Present surface soils are sandy loam or sand, low in organic matter, and they blow or wash readily. Subsoils are open sandy loam or light sandy clay loam. Below 2 or 3 feet is very sandy material which does not hold water well and is low in fertility. This land should be farmed in strips, on the contour if possible. Stubble should be worked into the soil. Soil-building crops such as alfalfa or sweet clover should be on the land at least one-fourth of the time. Additional recommendations for building up organic matter and fertility are given on the sheet of recommendations worked out by the Kansas Agricultural Experiment Station and the Soil Conservation Service.

Another land-capability unit in this area consists of the very deep, level, silt loam, upland soils. It is identified by the mapping units 261-Lo/A-1 and 261-0/A-1. The land-capability class is II, land subject to moderate limitations or risks, and the subclass is IIe, subject to erosion. These are deep, fertile, soils on which the only problem is a slight tendency to blow. Recommendations include good tillage practices, maintaining the surface soil slightly cloddy, working stubble partly into the surface, farming on the contour, growing soil-building crops at least

one-fourth of the time, and following practices to keep up organic matter and nitrogen.

These two examples show the kind of information that is now available for use with the land-capability maps in Ellsworth County. Similar information is or will be available wherever mapping has been done.

By way of summary, land-capability maps of the Soil Conservation Service can be used to good advantage as a source of facts about physical land conditions on farms and ranches. Occasionally the eight land-capability classes are adequate within an area such as a county for the classification needed for assessments. More commonly it is necessary to consider the significant variations known as land-capability units, or at least the intermediate groupings called subclasses. The local maps that are available can be consulted in work unit offices of the Soil Conservation Service. These maps show the basic physical land data of soil conditions, slopes, erosion classes, and other significant factors as well as the land-capability classification.

REPORT OF LAND RE-CLASSIFICATION
WORK ON VALUATION FOR TAX ASSESSMENT PURPOSES IN KANSAS

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In Kansas we can point with pride to Trego County in which a plan of reclassification of rural and urban property was undertaken in 1938. The plan put into operation at that time has been used with considerable success. A brief description of the Trego County plan is of interest.

The plan was worked out through the leadership of Mr. Worden R. Howat who was the elected county clerk at the time. In Kansas the county clerk with few exceptions is the county assessor. Mr. Howat, previous to being elected county clerk, had been in the Trego County Agricultural Adjustment Administration Office in the county where he had worked with committees of farmers in establishing productivity ratings for various farms in the county. He believed that an objective plan could be used in establishing values for farms for tax assessment purposes. He decided that the fifteen deputy assessors in the county (in Kansas deputy assessors for rural real estate are the elected township trustees) would be the logical persons to aid in working out a plan for re-evaluation of the land for tax assessment purposes. These men accepted this responsibility and the plan briefly described here was put into operation.

The first step in the plan was to determine the average income from an average acre of tillable land and an average acre of pasture land in the county. It was found that the ratio of income of tillable land to pasture land was 15:6. The next step was to classify land as to productivity using an average acre of tillable and pasture land as 100 percent. It was found that land in the county fell in a range of 70 to 120 percent. Land was classified primarily according to its use at the time and not according to its potential use.

The field work of the deputy assessors consisted largely of classifying each parcel of land on a farm as to productivity within the range mentioned above. Letter classes were established for various grades of tillable land with "A" for best grade and with "C" grade representing the average acre or 100 percent. Fifteen dollars per acre was established as the value of "C" grade land. The total acreage of each grade of land on a farm was established and a value per acre assigned which when multiplied by the acreage of that grade gave a sub-total value for the acreage of each grade of land on a farm. A total of these sub-totals plus the value of pasture land gave the total value of land in a farm.

Two criteria were used to adjust these total values--these were location in the county and distance from market. It was recognized that the average amount of rainfall decreased from east to west in the county and values were adjusted upward if the farm was located east of the center survey range in the county. Likewise values were adjusted downward on farms located west of this center range. Adjustment in value also was made for variations in distance from markets or trading centers. These two adjustments were made in the county assessor's office according to a predetermined formula and on a uniform basis.

When the value of the land in a farm was determined by the above procedure, the value of improvements was determined and added to land value to obtain the final value of the farm unit for assessment purposes.

This plan of reclassification while not perfect has worked well for the following reasons:

- (a) It is simple and easily explained.
- (b) It is easily understood by farmers.
- (c) It was made public by posting a map of all land in the county assessor's office where each farmer could compare his assessed values with those of his neighbors.
- (d) Values were arrived at by a definite method.

It is possible that the productivity rating for farms should be checked with detail soils maps which are available now for part of the county but which were not available at the time this plan was put into operation. Also other criteria than the two used might be used to vary values based on productivity of the land.

Out of this experience in Trego County, and the experience of other states in reclassification of land, has grown a proposed procedure for reclassification of land in Kansas for assessment purposes. The steps in this procedure are:

1. Collection of facts

May be standardized throughout the state.

Use of aerial maps to prepare tax maps and iron out inaccuracies.

2. Real estate index cards

Register of deeds is required to send a list of property transfers to the county clerk at the end of each day. Double card system - one by owner; the other by location - should be maintained.

3. Establishment of base values for each county

Reconnaissance or generalized land use capability maps are now complete for all counties in the state.

Basic productivity values for each kind of land on these maps will aid in equalizing between townships before making farm assessments.

4. Check these productivities against those of the PMA offices.

5. Township base values to be reviewed by an advisory board picked from county wide qualified persons. Objective thus far is to establish the correct relationship between townships.

6. Duty of advisory board would be to establish base values of each acre of tillable and pasture land in each township.

Pasture frequently is assessed too high, which encourages the owner to plow it up to get more return from it.

7. When base values for townships and for an acre of tillable and pasture land have been established this information should be made public. Letting the public pass judgment fosters public confidence.
8. Assessing the individual farm

Discuss method of establishing base values with township assessors with suggested procedure for rating individual farms shown by field demonstration.

Base values for township = 100%
Range 70 - 120 percent

9. Actual work of deputy assessor would be to establish values of various parcels of land on a farm within the range of values for the township.
10. Return to the county assessor's office for adjustments of external factors such as distance from market, all weather roads, etc.
11. Give publicity to assessed values by use of maps or whatever means seem desirable. Farmers should be able to compare values with neighbors and other farmers in the township or county.

Kansas counties at present are largely concerned with step 1 of the suggested procedure. Data are gradually becoming available for several counties in the state. Following is a report of the progress being made by the Soil Conservation Service toward the goal of obtaining in detail the land information needed in each of the counties in the state.

This is a summary of a report by Dr. Claude L. Fly, Soil Scientist, U.S.D.A., at a meeting of county assessors held at Kansas University in 1949.

"Sources of Useful Data on Crop Yields May be Obtained from:

- (a) State Board of Agriculture Reports
- (b) Farm Cost Account Records
- (c) P.M.A. Records
- (d) Experiment Station Records
- (e) Individual Farmers

These only serve as guides to productivity ratings for each kind of land. They must be interpreted in land productivity ratings by capable individuals, and identified on a land inventory map.

Land use should also be determined at the same time. After each kind of land had been examined and the important characteristics of each determined a basic productivity rating could be assigned to each piece of land.

Valuation based on the ability of land to produce could be determined from these productivity ratings. Other factors of an economic nature could be added later but should not be combined with basic physical data because

the latter is subject to slow change while the economic data would need to be adjusted more often.

You are no doubt wondering by now where in Kansas such a procedure could be applied. Two years ago I reported to this group on sources of information about the lands of Kansas which would be useable in tax studies. Allow me to briefly bring you up-to-date on these sources of information and the progress that has been made. I shall confine myself to maps which may be useful in general or specific appraisal studies.

Statewide maps include the following published and available:

1. Agricultural Resource Areas of Kansas, State Board of Agriculture Report February, 1946.
2. Climates of Kansas, Kansas Experiment Station Bulletin 302.
3. Geological Survey of Kansas.

These are useful only for very general studies zoning broad areas of the state.

Countywide maps suitable for identification and location of major land conditions and for township evaluations when used in connection with the more detailed surveys but not suitable for farm by farm evaluations:

1. Soil survey maps (scale 1 inch equals 1 mile; soil types and phases and base surveys) made from 1902 to 1937 inclusive; 22 counties completed.
2. Conservation survey maps (scale $\frac{1}{2}$ to 1 inch equals one mile; soils, slopes, erosion, drainage, present land use). All 105 counties are completed and published, 1941-1949, and tables are being prepared showing the same data by assessment townships and general productivity levels by soils of the township.

Detailed farm and area maps suitable for farm to farm evaluations when used with proper field interpretation:

1. Detailed basic soil survey maps (scale of 4 inches equals one mile; show soil types, soil phases, slopes, erosion, present land use and base features on aerial photographs). Such a study has been completed in Saline County, in part of Osborne County and is planned for Republic County, Kansas.
2. Detailed Soil Conservation survey maps (scale of 4 inches equals 1 mile; show soil types and phases, slopes, erosion, present land use and base features on aerial photographs). Completed for Brown, Labette, Geary and Grant counties; will be completed in Franklin county this spring and in Wilson, Osage and Lyon counties in the near future. This type of survey covers 40 to 60 percent of Coffey, Morris, Marshall, Nemaha, Pawnee, Ness and Trego counties.
3. Farm Planning Conservation survey maps (scale of 4 inches equals 1 mile; show soils, grouped for agronomic use, conservation and management similarities, slopes, erosion, present land use and base features on aerial photographs). These surveys are being made in every Soil Conservation District not mentioned above. Ellsworth county is completed;

Meade county made on a lesser scale is also completed. McPherson county has 215,000 and Finney county 158,000 acres. Since the surveys must be made at the request of farmers for soil conservation plans, they may not be contiguous but are complete for each farm surveyed.

4. Detailed Irrigation Land Classification surveys (scale of 1 inch equals 400 feet; show features essential to determining irrigation suitability). Kirwin, Bostwick, Kanopolis, Cedar Bluff units have been completed. The Webster unit is completed with soil types and phases added. Final irrigation classes are not yet assigned. These areas are small compared to the counties involved.

A total of 11,000,000 acres have been surveyed in sufficient detail for planning use, conservation and management of land and these maps are the ones best suited to tax assessment use. An inventory of the land resources of the entire state in similar detail would be of great value, not only in establishing equitable tax valuations on rural real estate but in speeding up conservation work on the farms of Kansas, and in crop and farm improvement programs through a thorough knowledge of the land, its capabilities and its needs.

In summarizing the following points should be stressed:

1. The basic evaluation of rural land for tax assessment purposes should be based on the relatively stable physical characteristics of the land.
2. The assessed value should be based on the long-time earning power of the land.
3. The physical and economic data should be kept separate.
4. The base value of each kind of land is subject to modifications owing to economic factors such as changes in price levels.
5. Physical land inventory maps properly interpreted may serve as valuable guides in rural real estate assessment."

Through the use of field checks, budgets and opinions of individual farmers, staff members of the Agricultural Economics Department, other Experiment Station personnel and Extension personnel are obtaining data that will aid in establishing productivity ratings for the various land classes or soil types within counties.

Interest in reclassification of land for tax assessment purposes in Kansas counties is increasing slowly. As 1950 was a year for re-evaluation of real estate, no change in valuations within counties will be possible until 1954 because Kansas statutes provide for re-evaluation every four years. It is expected that between now (June 1950) and the next re-evaluation year (1954) a few counties in Kansas will be interested in devising an objective plan for re-evaluation based on a reclassification of land and improvements. Geary, Franklin and Meade counties are known to have made a start toward developing such a plan.

An objective method of re-evaluation of urban property was tried with fair success in the city of Manhattan this year. A similar procedure was tried in Ford County for improvements on rural land with little success because farmers said that the plan penalized the family that made an effort to improve their living conditions by establishing nice farmsteads on their farms. It is probable that plans for reclassification of land or improvements should be carefully formulated based on established facts and adequately publicized among those affected before an attempt is made to put the plan into operation in a county. The effect of a poor plan which fails is hard to overcome no matter how good the plan may be that follows after the failure.

The following conclusions relative to the Kansas method of assessment of real estate for taxation purposes are taken from a study made in 1946 by means of questionnaires which were sent to county assessors (county clerks with few exceptions). These conclusions in a general way summarize the problems in Kansas with respect to assessment.

(1) There is need for a classification of agricultural land for assessment purposes. This approach is deemed practical, providing it is designed to fit the needs of assessing authorities.

(2) The aids made available to local assessing officers by the State Commission of Revenue and Taxation for the 1946 assessment have been exceedingly helpful. County assessing officers, recognizing the scope and importance of their responsibility, are calling for more help.

(3) Because the actual assessment of all property for taxation purposes now rests largely in the hands of numerous local (deputy) assessors, many of whom have neither the time nor the means whereby an equitable assessment could be attained, the first step toward improvement involves a re-examination of this part of the assessment machinery. When local government is too finely subdivided, too "local", it tends to become personal, then ceases to be impartial. A majority of the county clerks clearly indicate serious loss of confidence in the local (deputy) assessor system. The deputy assessor is grievously handicapped through lack of time, inadequate aids for attaining an equitable assessment, insufficient compensation to encourage special study or effort, and an inclination to rely on previous assessment records even though old errors may be perpetuated. In the opinion of a large percentage of county assessing officers, changes in the law pertaining to the allocation of assessment responsibility are essential to improvement.

CLASSIFICATION FOR TAXATION PURPOSES IN HARLAN COUNTY

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This paper will deal specifically with the work that has been done in Harlan County. Mr. Woodward has described the approach that has been taken in several other counties. Our approach in Harlan County is in no sense of the word an original approach. We have simply combined some of the ideas expressed by men in the Great Plains and given them a slightly different twist in order to make them applicable to conditions in Nebraska.

Reason for study: The incentive to begin work in this field at the time we did was provided largely by a committee of farmers and county officials of Harlan County, Nebraska, who came to Lincoln in the summer of 1948 to ask the Dean of the College of Agriculture for assistance in determining how they should go about revising their farm real estate taxation procedure to attain an equitable distribution of the tax load.

Backwaters from a dam on the Republican River in Harlan County will cover some 25 or 30 thousand acres of farm land and thus will materially alter the county property tax base. The county officials, realizing this, felt that they should revise their taxation procedure, particularly the assessed values of farm real estate, and were asking the College of Agriculture for advice.

Requirements of an improved method: A complete analysis of the assessment problem revealed that any effective improvement must possess four outstanding characteristics:

1. The assessed value determined for a property must be the value of that particular property and not the average value of many properties. In other words, it is the proper relative values that we are after.

2. A means must be provided to adjust the assessed values to account for material changes in economic conditions--giving, of course, due consideration to the relatively fixed costs which a county budget must meet. This becomes particularly important during periods of drouth or depression.

3. An improvement in one phase of property tax administration must not be made at the expense of another. That is, the cost of making an improvement in the method of determining assessed values must not be so great that it offsets any advantage derived from the improvement.

4. Any improved method of assessment must not be so complicated that the mechanism cannot readily be understood by the landowner.

The determination of assessed values of farm land, as we see it, may be divided into two phases: (1) classification of the land on the basis of productivity using physical characteristics together with present land use as the determinants, and (2) determination of the per-acre value of land in each productivity class. We will take up the classification of the land on the basis of productivity first.

The productivity classification: While productivity is influenced by many factors, the only two which we felt would vary materially from farm to farm, in a county, were the ability of the operator and the nature of the soil. For taxation purposes, we did not wish to penalize the efficient operator nor to grant favors to the inefficient, so we considered the problem from the standpoint of the average operator. (Moreover, the Constitution of the State of Nebraska contains a uniformity clause which makes the consideration of managerial ability a rather debatable issue, as well as an extremely difficult one.) This left differences in the productivity dependent upon the only relatively stable factor--differences in the nature of the soil. Differences in productivity due to the nature of the soil may be attributed largely to: (1) the type of soil, (2) the percent of slope, and (3) the degree of erosion.

Maps called Farm Planning Surveys are being prepared by the U. S. Soil Conservation Service for their own use in directing proper land use. The present land use--that is cultivated land, cultivated land under irrigation, pasture land, woodland, idle land, farmsteads and miscellaneous land uses--is illustrated on these maps together with a detailed survey of the soil made on the basis of soil type, percent of slope and degree of erosion. This is essentially the information we need in classifying the soil on the basis of productivity. This information is mapped on the Farm Planning Surveys through the use of land use and soil symbols. When completed, these surveys comprise the most complete inventory of the soil available. Copies of these surveys for any particular county may be obtained from the Soil Conservation Service if the county has been completely surveyed.

Since here in the Middle West most farm land transfers take place in terms of either 40-acre tracts or some multiple of 40 acres, we attempted to compute the value for each 40-acre tract as a complete unit. The value of a man's farm may then be determined by adding together the appropriate units. Obtaining copies of the Farm Planning Survey for Harlan County, we divided each section of land into 40-acre tracts and measured, within each tract the number of acres in each present land use class, and the number of acres within each class as described by each different composite soil symbol. By composite soil symbol I mean the symbol describing the type of soil, percent of slope, and degree of erosion.

Summarizing these measurements for the entire county, we approached a committee of well informed farmers in order to develop what we called a county productivity classification for each of the major land use classes. Hereafter this committee will be referred to as the classification committee. By major land use classes I mean cultivated land, cultivated land under irrigation and pasture land. For example, we pointed to a particular field on the map--a field familiar to the farmers--and said, here is a tract of cultivated land described by this composite soil symbol. Corn is the dominant crop grown on this land. What in your opinion, will be the expected average yield on such soil. We went through all the various composite soil symbols in that manner, so that when we were finished we had a productivity classification for all cultivated land in the county based upon the dominant crop, corn. Since in some sections of the county the land is planted to

wheat nearly as often as corn, we also developed a classification for wheat in a similar manner. (Had other crops been produced extensively, we would have developed productivity classifications for them too.) The average productivity of any tract of land in the county when planted in wheat or corn may then be determined by referring to the Farm Planning Survey and productivity classification. The productivity of the tract will be the same as the productivity class under which the composite soil symbol describing the tract is listed. Our class interval for corn is two bushels per acre, for wheat one and a half. Pasture land is classified in a similar manner except that it is based upon the number of acres required per animal unit during a normal grazing season rather than yield per acre.

Value per acre: The next step following the development of the productivity classifications, was to determine the per-acre value of the land in each productivity class. The Nebraska law states that all property subject to taxation must be valued and assessed at its "actual value". Actual value, as we defined it in this study, means the value determined by capitalizing the average annual net return from the land at the prevailing interest rate paid on investments of similar risk, and adjusted for such tangible factors as location and accessibility. We used a constant interest rate, believing that for the most part it is variations in net return rather than capitalization rates that cause differences in land values within a county.

To find net return we first determined the gross return per each class by multiplying the appropriate yield times the average price of the product. Next we determined the per-acre cost of production for each class. We combined information contained in production cost records we have in the office with specific local opinions of the classification committee in arriving at our final cost of production figures for corn and wheat. (The only two items which we did not include in the cost of production were interest on the investment in the land, and taxes on the land. These items are dependent upon the value of the land and it is value that we are after.) Subtracting the cost of production from the gross return, we determined what we called the net return per acre for each class of land within each productivity classification. This net return is essentially the equivalent of the interest on the investment in the land and the taxes on the land. In areas where two crops are of equal dominance, an average was taken of the net return for both crops.

Selecting an interest rate based essentially on farm mortgage rates, and a tax levy based upon a historical average of the total tax levies in the county, we added the two together and used this rate in capitalizing the net return for each productivity class. Although location and accessibility adjustments must still be made, we called this capitalized value the actual value from this point on. Returning to the Farm Planning Surveys, we determined the actual value of each 40-acre tract. This we accomplished by multiplying the number of acres we had measured under each composite soil symbol times the appropriate value of the land class under which each particular soil symbol was listed. For example, if we found a 40-acre tract of cultivated land described as Holdrege silt loam, with a two percent slope and class two erosion, we would scan through the productivity classification for cultivated land until we found this particular soil description. If it happened to be listed under a class

of land worth \$30 per acre, the actual value before adjustment for location and accessibility would then be 40-acres times \$30 or \$1200. We adjusted the value of each 40-acre tract, \$1200 in this case, upward or downward by an appropriate percentage factor. The factor was determined by studying the location of the 40 with regard to paved, gravel or dirt roads, mail routes and towns, and comparing this location with a predetermined formula. Under this formula the value of land within a certain distance of a paved road would be increased somewhat, that near graveled roads would remain the same, and the value of land accessible only by dirt roads would be reduced somewhat. Mail routes and other factors were handled in a similar manner.

Equalization adjustments: While the law states that the assessed value shall be the actual value, this is rarely the case at the present time, particularly as long as each county uses a different method of determining assessed or actual value. It will be necessary for the tax equalization board to adjust all values in order to bring them in line with other counties. In Harlan County it will be necessary to adjust the actual values downward. This will be accomplished by simply reducing them by whatever percent is considered necessary as they are all, in a sense, relative values.

Present status: The determination of the assessed values for all land in Harlan County is now better than 90 percent completed. Most of the work was accomplished in the Department of Agricultural Economics in Lincoln through the use of funds appropriated by the county for this purpose. The remainder of the work is being conducted in Harlan County by county personnel. As records in the County Clerk's office will be needed to complete the work, arrangements were made for the Deputy County Assessor to complete the details.

A station publication describing our procedure will be available for distribution by October or November, 1950. At the present time we are working in cooperation with the State Tax Commissioner in planning a 3-day course of instruction for all county assessors to be held in Lincoln in January. In this course, or conference, we hope to cover the procedure I have just described, together with suggestions concerning how the assessors can adapt the procedure to fit their local needs and conditions. We will also derive many worthwhile suggestions from this conference here in Montana which we will include in our program next January. If the January conference is successful we hope to have another the succeeding year and to expand our coverage to include the assessment of farm buildings and urban real estate.

LAND CLASSIFICATION FOR TAXATION PURPOSES IN NORTH DAKOTA

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There are some indications of interest in a scientific re-classification of North Dakota's farms for taxation purposes. John Gray, Tax Commissioner, pointed out in the eighteenth biennial report (1944-46) of the Commission that "careful consideration (should) be given to setting up the legal machinery for the classification of lands for the purpose of valuation for taxation.....To assure uniformity, the classification should be done through some state set-up, the personnel, duties, and scope of which to be specifically covered by statute, and the work to be done jointly by the counties and the State under the supervision of the Agricultural College if possible." Careful work has already been done in a few counties, McKenzie and Sargent counties having made extensive use of the results.

In the case of McKenzie County a modern detailed soil survey was completed in 1935 including the now widely used "productivity ratings." The basic soil data were interpreted in an economic sense providing an economic classification for each forty acre tract of the nearly two million acres in the county. Arne Tollefson, auditor for the county, reports complete satisfaction at the local level with the results. Township assessors and boards continue to use the values derived in the classification to validate the assessments annually. Sellers and buyers of land have made wide use of the figure.

The McKenzie Classification had the advantage of a detailed soil survey which, when put in the hands of local groups in deriving fair sale value, was extremely useful. In Sargent county on the other hand, the reconnaissance soil survey available had to be checked by a soils expert before being used. It turned out that the survey was essentially valid for the purpose at hand. The Sargent County procedure grew out of the land use planning committee approach to rural problems. Farmers in each township were asked to select the best parcel of land in their respective townships. Their selections, checked with the soil classifications, established two soil types as 100 per cent. All others were rated in relation to them and values derived for each 40 acre tract. Mr. Thorfinnson of Lisbon, North Dakota, checked the assessment roll in 1946 and found that 93 per cent of the assessed values followed the economic classification very closely. Here again the local people appear to be entirely satisfied with the work.

Legal Status. Unfortunately, there is no law which provides for the funds needed for classification. No economic classification has been registered with the Tax Commissioner even though such work supports the assessments in some counties. Finally, no law prescribes that a township assessor must follow such a classification when made.

Data Available. To date only Morton, McKenzie, and Billings counties have modern detailed soil surveys. Renville County is now in process of being surveyed. Semi-detailed surveys are available for Bottineau,

McHenry, Traill, and Cass counties. With the exception of Sargent, other counties will have to be re-classified (where some work has been done in the past) or classified for the first time. Soil Conservation Service farm surveys are available for some block areas and scattered farms in many counties. All told, information is available for a generalized map of soil areas in North Dakota for about 75 per cent of the State.

In addition, crop yield data could be obtained from P.M.A. offices, surface features from aerial photos, hail ratings from the Federal Crop Insurance Corporation, and farm business studies made by the College of Agriculture could be utilized. Individual yield records could be located here and there as supplemental.

What Needs to be Done? If action is taken in North Dakota toward land re-classification for taxation purposes, it seems probable that the work done in McKenzie and Sargent counties will be brought to the attention of the public. Then, if any group of farmers requests assistance with their land valuation problem, sample townships in areas displaying such interest could be used in developing an effective method under existing conditions for re-classification. Local farm committees should be intimately involved in the process. If the farmers, assessors, and technical personnel succeed in developing a satisfactory procedure, the work should be widely publicized. From such a core a successful State program could be evolved. This would eventually lead to legal provision for funds necessary in executing the work.

HAS LAND CLASSIFICATION FOR TAXATION PURPOSES IN HAND COUNTY
SOUTH DAKOTA BEEN A SUCCESS?

Russell L. Berry, South Dakota State College

Farmers in Hand County, South Dakota, can take considerable pride in their efforts to equalize taxes through land classification. In most counties of the state, township assessors lack information about comparative merits of soil type, slope, susceptibility to erosion, and the productivity of land in different quarters of each section to make a fair and just appraisal. They lack information about similar land in other townships. But this is not true in Hand County, even though township assessors may not be using their land classification work to best advantage.

Ten years ago, in 1940, every quarter section of farm land in Hand County was classified as to its productive ability. Nine productivity classes were used in the county without regard to township lines. As a result, each of the 40 township assessors could keep the proper spread in values between the different land classes. County and state taxes could be spread over all the farmers in a fair and reasonable manner. Each township was assessed according to its worth.

Committees of practical farmers did the work. The Soil Conservation Service made a reconnaissance soil survey to help, as a detailed soil survey had not been made.

In those townships in which the 1940 assessed valuation and the recommended assessment figure were too far apart, it was decided by the boards of equalization that a gradual change over a period of two or three years might be advisable. A state limitation on the levy on agricultural lands also prevented some townships from reducing the assessed value to true and full value established by the county commissioners.

But how has this stood the test of use and time? After all, the proof of the pudding is still in the eating. Time had dimmed memories of the land classification made in 1940. The large map showing the productivity rating of every quarter section of land in the county no longer hangs on the wall in the county commissioner's room. It is rolled and stored as old maps usually are.

For about four years the system worked very well, according to one official. Each township assessor had been given a map of his township showing the land classes by quarter sections, but there is considerable doubt as to whether they are still being used today. After all, the township assessor works only 10 to 15 days per year at the most; his pay is not usually more than \$150 per year, and he must stand for election each year, although he is reasonably sure of being reelected if he wants it. It is difficult to secure candidates for the job.

With 40 township assessors, it would not be surprising if they had drifted away from a land classification set up ten years earlier. Furthermore, under the circumstances, it is difficult to see how such a drifting away could be prevented. Unless Class I land has some topographic or

soil feature that is easily recognized by an untrained assessor, the Class I land is apt to be assessed as Class II land----particularly if it is surrounded by Class II land. The same reasoning would apply to other land classes, especially where one or more quarters of good land are surrounded by poor land as is frequently the case in the map prepared in Hand County.

However, the tendency for assessors to use the values set in the previous year may have acted as a brake on the drift away from land classification. This may be an important point, as will be seen later.

Some officials in Hand County are of the opinion that assessors were valuing the land in their township without regard to the values placed on the same land class in an adjoining township. Some felt that the township assessors had gone back to the uniform township assessment regardless of the land class----just as assessors had done before 1941.

To check these doubts, the 1949 assessed values after equalization for each township were compared with the "fair and full value" or average that the county commissioners had set after the land was classified in 1941. While the average assessed value for the 40 townships had increased about 25 percent during the eight years, the increase was remarkably uniform except for those townships that were above fair and full value in 1941. In these townships the increase was only 10 to 16 percent. Thus increased land valued have made it possible to reduce some of the inequities that were allowed to remain after the 1941 classification of the land.

This speaks well for the commissioners and their efforts at equalization among the townships and perhaps for the assessors as well. The conclusion is that the spread of taxes between townships is probably more equitable today than they were in 1941----partially, but only partially, as a result of higher land values.

Have the township assessors gone back to the flat rate assessment of quarter sections that had been largely customary before the 1941 land classification?

To answer this question County Auditor Haas brought from the commissioner's room the large map showing the productivity rating of every quarter of land in Hand County. Using this map, Carlton township was selected for further study.

Carlton township was chosen because it contained several classes of land. By checking the values placed on each quarter of the land for 1949 against the land classes shown on the map made in 1941, it was easy to see that the land classification made eight years earlier was still being followed to a considerable degree. Whether or not the difference in valuation between the different grades of land was as wide as it should be was not checked.

That a more thorough check was not possible was unfortunate because this one township suggested that once the land classes were established and appropriate values placed upon them, the assessors tend to use the same relative values, rather consistently changing them only in those

cases where the reason for a higher class was not readily apparent or where farmers have asked for equalization for the same reason.

Lacking further evidence to the contrary, the statements of the county officials must be relied upon. If they are right----if after four years many of the township assessors went back to the fixed level of assessment in their townships without regard to values assigned to neighboring townships----then this fault should be corrected.

Perhaps the most favored remedy to the whole problem of fair evaluation is to substitute a county assessor for the present township assessors. Forth-three of 51 counties replying to a question by our chairman Norris Anderson ten years ago favored the county assessor system. Thirty-three counties favored larger assessment districts. Thirty-eight favored land classification. Thirty-two approved using experienced farmers to classify land as was done in Utah.

Norris J. Anderson, Assessment Procedure and Problems in South Dakota, South Dakota AES Bul. 355, 1941, p. 11. This bulletin contains the best description of the Hand County land classification work that I have found.

Unfortunately the general public is not as well informed, or as convinced of the need for classifying the land because a petition signed by 20 percent of the freehold electors can secure the classification of all real estate in the county. This law has been on the books since 1930 but has not been used.

At least nine counties in the state are using the county assessor system, in part at least. Butte County is an example. Butte County has adopted the Bureau of Reclamation classification of land for taxation purposes in the Belle Fourche Irrigation project. They have, however, distinguished between the upland or gumbo soils and river soils, even though for irrigation purposes they sometimes fall in the same class.

The method by which the Bureau of Reclamation classifies their soils can be secured from them and does not need discussion here. However, the classes and the assessed value per acre are presented in Table 1.

Table 1. Land Classes and Assessed Valuation in Belle Fourche Irrigation Area, Butte Co., S. D.

Class	River Land*	Upland or Gumbo**	
	Ass. val. per acre	Class	Ass. val. per acre
1	37.50	1	30.00
2	25.00	2	20.00
3	20.00	3	16.00
4	15.00	4	12.00
5	10.00	5	8.00
6	4.00	6	4.00

- * Best land around Vale, Nisland and Fruitdale.
- ** Lower grade land. No Class 1 and very little Class 2; mostly Class 3 and 4.

Whether the dry lands and other privately irrigated lands in the county are classified for tax purposes is not known.

In Hand County part or all of twelve townships lie within the Miller-Vayland area of the Oahe Irrigation Project. Within the next few years the assessment of irrigation land will create new problems for the township assessors.

While we can conclude that the Hand County work was partially successful, efforts should be made to encourage township assessors to use or revise the land classification map at their disposal. Only by the consistent use of such a classification can land taxes be made fair and equitable.

In the meantime, attempts have been made at the last several sessions of the Legislature to enact a County Assessors law with the idea that the County Assessor would hold office the year around and could start in some manner to classify all property within the county. Potter County, for example, has had the same county assessor for the past 22 years. Such tenure should provide ample opportunity to establish assessment values on the basis of productivity.

BRIEF HISTORY OF LAND CLASSIFICATION
IN NEBRASKA

E. F. Woodard, Field Representative, Nebraska Tax Commissioner

Classification of urban and rural real estate for taxation began approximately twenty years ago. By mid-1930, five counties had completed an initial classification. Thereafter progress was retarded by depression and lack of revenue with which to conduct further work.

Since 1930 the office of the State Tax Commissioner has been transcribing data on real estate sales, both urban and rural. Sale price, number of transfers, location, assessed valuation, have been recorded. Only those transfers typical of a free market situation were recorded and used.

In most counties present and potential use were taken into account for classification purposes. Information from several sources has been assembled and used in a classification process. Sale price has been relied upon to reflect productive capacity. Subsequent experience has appeared to justify the inclusion of sales data.

Recently, classification has been conducted in additional counties with the aid of soils maps, aerial maps, and yield records. In some counties commercial firms have been employed to conduct the work. In other counties local committees assemble the necessary information and conduct the classification procedure. Close contact with the procedure is maintained by the State Tax Commissioner and his field representatives.

Forty-three of Nebraska's ninety-three counties have completed or are engaged in land classification. Imperfections are recognized. In spite of limitations imposed by lack of information, progress can be reported. The results of land classification conducted to date, largely by local authorities with the aid of the State Tax Commissioner and field representatives, constitutes improvement over what was in effect before classification was started.

LAND CLASSIFICATION FOR TAXATION PURPOSES IN WYOMING

John A. Hopkin, Ag. Economics Department, University of Wyoming

Let me say at the outset that the College of Agriculture at the University of Wyoming is somewhat of a non-participant in the problem of land classification for taxation purposes in Wyoming. In this sense, this meeting is a forerunner of the problem. We, at the college, can get in condition and learn the principles of the game, so that we can play our parts well when we are called upon for assistance.

The procedure for classifying land for taxation purposes, as carried on by most of the assessors, and their staffs, is not completely uniform and is based on description, generally. That it is a rough approximation can be seen from a statement of one of our county assessors who recently told me that in assessing land in his county, he knew land was better on the west side of a certain valley than on the east side, so he placed 81 percent of the land on the west in Class I and 62 percent of the land on the east in Class I.

The old-type soil classification maps are available for some counties in the state, but they are used very little by the assessors, and only in a general way.

Wyoming has a State Board of Equalization formed with the responsibility of making the evaluations equitable as between counties. While I have a great deal of respect for this Board, and the quality and integrity of the men on it, they have been handicapped in certain fields.

In trying to get at the problem of equality as between counties, the Board does some preliminary work and gets its recommendations to the assessors before the assessment begins. This is very helpful.

The Board of Equalization has the "go-ahead" and the funds from the Legislature for building and improvement reappraisal. This has gone forward in a remarkable manner and has been quite generally accepted by the people. One of the results of this building and improvement reappraisal is that the small farmers and the farmers that have built up their homes and improvements have been penalized.

Perhaps the present problem of land classification and evaluation can be hinted at, at least from an economic study of Goshen County in Wyoming. This comes as a complete side-line and by-product of the study. The enumerators, with the assistance of the farmer, evaluated the land, which was quite uniform and all of which was within a fifteen-mile radius. The value of the buildings was determined by the operator, using replacement cost less depreciation. The value of machinery was determined by the operator, taking new purchase price less depreciation. The operator determined the value of livestock at market price for similar grade.

Using these values, and the actual property taxes paid by the operator, it was found that the rate of taxation assessment varied from 2.83 percent to 0.44 percent among the 60 farmers.

Dividing the farmers into two groups, on the basis of tenure, the owner-operators paid taxes at a rate of 0.88 percent of average investment. The tenant-operated farmers paid taxes at an average rate of 1.37 percent of investment, or about 0.6 percent higher than for the owner-operators. This indicates that land, in the county, may be assessed much lower, relative to its value, than are improvements, machinery and livestock. Perhaps this explains why the Board of Equalization was stymied by the Legislature in its attempt to get funds for a state-wide program of land reclassification.

One problem that Wyoming has, that some of your states do not face, arises from the existence of much federal land in the state. In some counties, a majority of the land is not on the tax rolls, thus throwing a burden on the privately owned land. This federal land is used by a few individuals in the county. The assessors, thus far, have not given consideration to the use of federal land when evaluating the privately owned land.

As I see it, the problem in our state is really one of education, and centers in three general areas.

First, the assessors. Here, Wyoming has made a definite contribution in their Annual Assessors' School, sponsored by the Division of Adult Education and Community Service of the University of Wyoming, with the assistance of the Board of Equalization. The assessors, some commissioners, and others interested in the field, have received instruction and training leading toward uniformity and a higher standard of assessing in the state. Much will yet be done in this field.

The second area of education is that of the people. They must accept the program before it can be effective. They are generally confused by classification versus evaluation, and are often afraid that reclassification is a method of collecting more taxes and not of distributing the present tax load more equitably. Perhaps if this area is properly educated the third area may be omitted--the Legislature. It is the State Legislature that corrects the statutes and appropriates the funds that makes a land reclassification program possible. Many of these men are large landholders and must face this problem open mindedly if they are to contribute to the welfare of the counties and taxpayers, generally.

While these problems may be beyond the scope of land reclassification, as such, I want to throw out these questions and situations with the idea that they will be discussed at some time during the meeting.

1. On one side of the fence we have land broken up as dry crop land. On the other side of the fence, with the same land that is capable of sustaining wheat production, we have grass land. How should these two tracts of land be classified? And how should it be evaluated?

2. Do we not tend to penalize progressive management? Is this correct?

3. In the evaluation process, little consideration has been given to size that goes to make up the economic capacity of a given unit. Is this correct?

4. Through land classification, we have a powerful tool for land use reform. Should it be used in this direction?

The last thing I wish to mention, and it is here that the program succeeds or fails, has to do with the problem of selling it to the people. It is one of public relations.. For this purpose we have gathered in this county in Montana to see how this job is being done by the people on the firing line.

LAND CLASSIFICATION IN RELATION TO COLORADO'S
TAX EQUALIZATION PROGRAM

D. M. Stevens, Associate Rural Economist, Colorado A. & M. College

Introduction

In the program of rural land reappraisal for taxation purposes, Colorado's policy has been to: (1) base value on the long-time earning power of the land; (2) place the basic evaluation on physical characteristics since they are relatively stable; (3) recognize that the base value for each class of land is subject to modification due to economic factors and therefore incorporate such modifications into the physical classification base.

Legislative Authority

In 1947, the Colorado State Legislature enacted into law a bill making an appropriation of \$100,000.00 and calling for a reappraisal of all real property in the State for the purpose of achieving equalization in values for assessment purposes and also to establish a uniform and consistent method of appraising property in the several counties. The moneys were to be expended during the biennium ending June 30, 1949. The legislature stated in essence that the reappraisal must be made in accordance with provisions of the Colorado statutes which set forth the powers, duty and authority of the Colorado Tax Commission. Mr. L. Don Daily, a specialist in property appraisal (formerly employed by the Illinois Tax Commission), was hired by the Colorado Tax Commission and placed in charge of the entire reappraisal program. The statutes setting forth the duties and authority of the tax commission state in essence that the commission shall have general supervision over the administration and enforcement of all laws for assessment and levying and collection of taxes to the end that all assessments be made relatively just and uniform and at its true and full cash value. The law requires that the tax commission prescribe a uniform system of procedure in the assessor's office with regard to form and size of tax schedules, tax rolls, etc. If, in the judgment of the tax commission, any property has not been assessed at its true and full cash value, the commission shall make a reappraisal of the property to the end that all classes of property shall be assessed in compliance with the law.

When the reappraisal program actually commenced June 1, 1947, few counties had funds available for such a program and little progress was made until 1948 when the counties were able to budget for such a program. That the program was long overdue is indicated by the fact that there were about 30 different variations of methods in assessment practice, all designed to arrive at the statutory requirement of "true and full cash value" assessments.

Tax Equalization Policy Guides

In initiating the new tax equalization program and in compliance with the law, certain fundamental policies were set up as guides:

1. A uniform property classification must be used throughout the state. This assures the taxpayer his property is considered on the basis of the same facts as similar property of other counties. This should help reduce competitive undervaluation of certain counties in order to escape the full effect of the state tax. The uniform property classification should reduce inequities where school districts overlap into two counties subject to two assessors. Furthermore, similar property in the same county will be treated in a uniform manner thereby reducing inequities.

2. Uniform appraisal forms are used throughout the state. This, it is believed, will aid in carrying out the policy outlined in the paragraph above. It will make for an orderly and specific approach to property assessments.

3. Uniform procedures must be used in all counties. When reappraisal field crews or assessors measure, describe and value property, the same approaches will be used throughout the state. These uniform procedures have been drawn into the form of instructions and are in possession of all counties.

Insistence upon uniformity has a three-fold purpose: First, early completion of an equitable and fair appraisal; second, appraisal of property on a parcel basis so there is a separate card for each piece of property in each county; lastly the installation, simultaneously with the reappraisal, a uniform assessment system throughout the state.

"Full Cash Value"

Land classification work began in an experimental way in only four counties in 1948. The statutes require that all taxable property shall be listed and valued each year and assessed at its full cash value; land to be listed and valued separate and apart from personal property and improvements. The statutes set up certain guides to the assessor in determining this full cash value. Market value shall be one guide. If the market value cannot be readily determined, the price it would bring at a fair voluntary sale, the value of use, the capability of use together with other just methods of determination may be considered by the assessor.

In determining the proper price level to use in establishing the value, several problems arose. The 1948 level of sales price would greatly increase assessments, and if fixed state mill levies were not reduced, would result in large increases in the tax bill. Also land appraisal at this level would probably result, after a few years, in higher values than it would bring on the market. It can be assumed that the present market value exceeds the true and full cash value since both high and low price years must be considered in determining the average or long-term earning capacity of lands. After considering these facts the Tax Commission, assessors, and the State Planning Committee all requested that the appraisal use a pre-war, pre-inflationary level sufficiently conservative to avoid a major upset in taxation policy at a later date. With such an approach it would be possible to attain the program's goal: equalization both among individual properties and individual counties, and among property in all of the counties.

The man who owns land is interested in what it will produce, or in the words of the state statute, its "capability of use." One must consider production adjusted for such factors as water rights, location, distance to market and certain other factors. With regard to water rights, Colorado's approach has been to value water on the basis of what it contributes to land in terms of increased productivity.

Principles of the Land-Capability Classification

Soils differ in physical characteristics and these characteristics differ in degree and kind, and therefore impose varying limitations upon the use suitability and productive capability of the land. Some of the significant physical facts which can be observed about land include: the soil texture, depth, permeability, slope, topography, water table conditions, overflow hazards, susceptibility to erosion, etc.

Classifying land as to its physical and productive capability is the work of a group of specialists; the agronomist, engineer, forester, biologist, soil conservationist and soil scientist who consult with practical farmers and study the results of experimental work. Thus a land-capability classification represents the combined judgment; it is an interpretation of available facts and describes the physical capability of land for cultivation, grazing or other uses. A land-capability unit is the smallest unit of land-capability classification. Each of these units consists of the land within specified limits of soil, slope, degree of erosion, and other physical land characteristics. Land in a land-capability unit is essentially uniform with respect to physical features (including climate) that affects the plants that can be grown, and the responses of vegetation to management. Essentially similar cropping systems or other land-management systems are applicable throughout the unit. Land-capability units are the physical land-treatment units as far as permanent, mapable land features are concerned. Each one has nearly uniform use possibilities and conservation needs.

Adoption of S. C. S. Land Classification System

After a rather thorough and exhaustive study of the several systems of land classification, Mr. Daily, with the approval of the State Planning Committee, selected the Soil Conservation Service land capability classification system as most nearly meeting the needs of the rural land reappraisal program in all details. The land capability classification was selected for the following specific reasons:

1. The classification is based upon detailed information pertaining to the workability, permeability, depth and water-holding ability of the soil; slope of the land; amount and effect of erosion; effect of salts in the soil on crop production; effect of a watertable on crop production; effect of flooding hazards on crop production; and the effect of existing climatic conditions on crop production and land management needs. All of these are physical conditions known to affect the ability of land to produce crops. Also these physical conditions are shown on maps which permits ready interpretation and use of the data by county assessors.

2. The land is classified both on the basis of its true capability and on its condition at the time of mapping, thus permitting the assessor to consider "present conditions" on those lands which have not been fully developed to their capability.

3. Only eight land classes need be used, yet detailed information is available for a further breakdown of the land classes into sub-classes, etc., should this prove to be necessary.

4. The land capability classification is sufficiently flexible to permit periodic revision and modification or change as new information on crop adaptations, land management methods, etc., become known.

5. Land capability classification maps already were available for a large portion of Colorado and were being made in the State at a fairly rapid rate, although not as rapidly as to fully meet the needs of the reappraisal program.

Use of S. C. S. System as Departure Point in Determining Land Values

The Soil Conservation Service land classification system has been used in Colorado as a base or departure point in establishing land values by classes. Since parts of the method must still undergo "field-test" it is anticipated that additional refinements will be incorporated. At the outset it was recognized that any single set of base values assigned to each of the eight land classes on a state-wide basis would not achieve equalization. For example, one parcel of class III land is in class III primarily because of degree of slope, while another bears that classification primarily because of amount of precipitation, and still another because of the degree of permeability of the soil. Partly as a reflection of these differences, crop production by land class varies considerably from area to area within the state.

The fundamental concept of the rural land appraisal program is that land values are determined by what the land will produce in terms of goods: income and certain indirect satisfactions. If land values are dependent upon and determined by what the lands will produce, their value can be estimated on the basis of what the lands have produced in the past. The Economics Department of the Colorado A & M Experiment Station, at the request of the Colorado State Tax Commission, prepared an analysis of crop production and prices in Colorado for the period 1934-43. This period was selected because it represents both good and poor years so far as both production and price are concerned, because the most nearly reliable crop production records are available for the period and because the reappraisal program is attempting to secure uniform appraisals on a pre-inflationary basis. The specific assignment given the committee was to determine by the use of these statistics and 10 year average prices the average gross return per harvested acre separately for irrigated and dry-land for each major crop in each county and for the state as a whole. For grazing land, war-board grazing capacity figures were used and expressed in terms of acres per animal unit of one steer or five sheep. An average "payment to landlord" per animal unit month was then used to establish a value per acre figure.

With these calculations at hand, and by using farm business analysis records of the Economics Department to establish a somewhat arbitrary figure of 10% net return to the landlord as representative of average operations, and then by capitalizing the net at 5%, an average dollar value for the county crop-land (separately for dry and irrigated land), was established.

The next step was taken to determine the gradations of values by land classes. Recognizing that homogeneous farming areas do not begin or stop at county lines, efforts were made to delineate, irrespective of county boundaries, areas of like physical land conditions, type of farming, farming methods, etc. within which the same base land values should apply. For example, it was believed that the base values established for the irrigated lands in Otero County should not be limited strictly to Otero County but should apply also to certain areas in Pueblo County where land conditions, etc., are very similar. The ideal situation would have been to determine values by land class in accordance with such "natural" boundaries. However, since all statistics on which the formula is based are available only on a county basis, the best compromise was to group counties into areas which recognized "natural" boundaries insofar as possible. This approach minimized, but did not eliminate, differing cross-county-line valuations. The aim then was to determine sets of values by class consistent within the designated areas. Three sets of area groupings will ultimately have to be made - one for dry crop land, one for irrigated crop land and one for grazing land. To date only the eastern Colorado dry crop-land grouping has been established.

To clarify the above procedure an example will be given of the "area approach" method for setting values on dry cropland for the four county area-Logan, Sedgwick, Phillips and Yuma in northeast Colorado. Through knowing the percentages of total cropland represented by Class II, III and IV cropland within each county in an area, and the average value per acre of cropland in the counties, simultaneous equations can be used to establish a theoretical value by class. This procedure indicated the following set of dry cropland values per acre for the counties in the northeastern corner of Colorado would most closely satisfy each county's theoretical load requirement, as well as carry the total area load: Class II - \$12.00, Class III - \$9.00, Class IV - \$5.00. It was realized, however, that the basic data upon which calculations were originally made were far from perfect and, in addition, that better public acceptance results when decisions are made with participation of those most directly affected. Therefore, a mimeographed statement was prepared for submission to county agricultural planning committees preparatory to an "area" meeting which was devoted to final decisions as to base land values, by class. After the material in the mimeographed statement had been thoroughly reviewed at the county meetings, county delegates were selected to represent their counties at the area meeting. For the area meeting, the following guide was prepared for use in setting values for the area:

"1. Cropland acreage in the area by land class is as follows:

Class II	1,171,227 acres or 61 percent of the total
Class III	479,701 acres or 25 percent of the total
Class IV	263,649 acres or 14 percent of the total
Total	1,914,577 acres or 100 percent of the total

"2. The average value per acre on the whole cropland area, determined as explained at the county meetings, is \$10.50.

"3. Total area - 1,914,577 acres times average value - \$10.50 equals a total valuation of crop land in the area of \$20,098,024.

"4. To maintain the \$10.50 average then, any set of values selected (when multiplied by the acreage of cropland in each class, and the amounts for the three classes added together) must total to approximately \$20,098,024.

"5. All of the sets of values set forth below will meet this requirement:

	Class II	Class III	Class IV
*	14.00	5.60	4.00
	13.50	6.80	4.00
	13.00	8.00	4.00
	12.50	9.30	4.00
	12.00	10.50	4.00
	13.50	6.30	5.00
	13.00	7.50	5.00
	12.50	8.70	5.00
**	12.00	9.80	5.00
**	11.50	11.10	5.00
	13.00	7.00	6.00
***	12.50	8.10	6.00
	12.00	9.40	6.00
	11.50	10.70	6.00

"* For example:

\$14.00 times the 1,171,227 acres of Class II land equals \$16,397,178
5.60 times the 479,701 acres of Class III land equals 2,686,326
4.00 times the 263,649 acres of Class IV land equals 1,054,596
\$20,138,100

"** or

\$12.00 times the 1,171,227 acres of Class II land equals \$14,054,724
9.80 times the 479,701 acres of Class III land equals 4,701,070
5.00 times the 263,649 acres of Class IV land equals 1,318,245
\$20,074,039

"*** or

\$12.50 times the 1,171,227 acres of Class II land equals \$14,640,338
8.10 times the 479,701 acres of Class III land equals 3,885,578
6.00 times the 263,649 acres of Class IV land equals 1,581,894
\$20,107,810

"Your job as county committeemen is to select the set of values that you feel most truly represents the relative difference in value as measured by productivity between the three classes of land. The examples above were not picked to influence judgment as to which set of values should be chosen but rather to illustrate that all sets will total to approximately \$20,098,024 and therefore that any of the sets would meet the area requirement as to total valuation for dry cropland."

All comments received to date on the procedure and its results have been favorable. The primary handicap in carrying the project on to conclusion is the lack of the basic soils and classification data referred to earlier in this report. Nevertheless, it is believed that the method of approach is sound, and that there is enough reason for optimism in expecting completion of basic data within a reasonable time to obviate any necessity of substituting less desirable alternatives. On the other hand, no one would pretend that the system developed is without flaws. The most serious weaknesses are probably these:

1. Crop production records (1934-43) used tend to freeze value - and county statistics to check this feature are unavailable since 1944. There is promise now that this situation will be remedied..
2. Applying an average "net" of 10% as return on crop production (with conditions and types of farming varying as much as they do in Colorado) needs further study.

THE EDUCATIONAL JOB OF THE STATE AGRICULTURAL PLANNING COMMITTEE
WITH REGARD TO THE REAPPRAISAL PROGRAM IN COLORADO

Brett Gray, Colorado State Agricultural Planning Commission

Perhaps a short resume of the foundation and workings of the State Agricultural Planning Committee of Colorado would be the best way to explain its educational work on the reappraisal program.

The Planning Committee finds its basis around a framework of hard-working people in the Extension Department of Colorado A & M College. The County Agents serve, as a general rule, in an advisory capacity and as liaison men to the State Committee. The secretaries of the state sub-committees are usually members of the Extension Staff at the College.

The County Planning Committees, in general, are set up in this way. The County Agent, with the advice of a few outstanding agriculturists in the county, calls a meeting of the most active and interested agriculturists in the county. These men are appointed to serve on various sub-committees for work within the county. The sub-committees depend entirely upon the specific problems within the county. As a general rule, a County Planning Committee will have two or three people on a Committee, but they may, of course, be expanded to any size, depending upon the action desired. The President of the Home Demonstration Council is always a member, as are the leaders of the 4-H Council. In most cases a key banker and a few of the more active business men are asked to sit in an advisory capacity on the County Planning Committee. In many cases the County Commissioners as well as some of the other county officials are quite interested and have become active in the organizations. After a few meetings and as leadership develops in the committee, officers are elected to direct the general program.

The State Committee is composed of delegates from the County Committees, usually selected by the county membership for their ability and interest in the various problems presented on the state level. A very significant fact is that every farmer-member serves without compensation or expense account.

At the present time the State Agricultural Planning Committee has active the following sub-committees: Rural Taxation, Health, Conservation, Roads, Education, Research, and Plains Policy.

Some 450 farmers and ranchers from 49 counties in Colorado are active members of these seven sub-committees. They, in turn, are the "cream of the crop" of some 9,000 agricultural people on the county level and no one has been able to estimate the number of people that they contact and influence.

The sub-committee on taxation came into being during the time that the State Legislature was preparing and passing a bill requiring the reappraisal of all real property in the State of Colorado. The problem of equitable real estate taxation has been a very genuine one to farmers and ranchers for many years and the members of the committee were most interested in keeping close contact and, if possible, some control over the methods to be used in the reappraisal program.

In the past $3\frac{1}{2}$ years they have followed the action of the State Tax Commission and the Reappraisal Division very closely. It is to be said that the reappraisal personnel have been most cooperative and I am sure very glad to receive the assistance and advice of this sub-committee. Very few of the policies on rural lands or improvements have been arrived at without a great deal of discussion within the sub-committee on taxation and with the exception of the absolute requirements of law, no steps have been taken without the recommendation of this committee. The result has been a very cooperative program which with the approval of the State Agricultural Planning Committee has received tremendous support and has served as an excellent educational means for the Tax Commission.

This educational program works along these general lines. After considerable discussion, specific recommendations are made to the Tax Commission and upon acceptance are laid before the entire State Agricultural Planning Committee. After a careful explanation and an okay from the State Committee, information about that particular phase of the reappraisal program is distributed through the counties by word of mouth from all of the State Committee members and by some mimeographed and printed material prepared by the Extension Service. In addition to this word of mouth and printed material, county meetings have been called jointly by the Tax Committee and the Reappraisal Division wherein the general outline of the reappraisal program is very carefully explained. Later, area meetings are called, usually comprising 3 or 4 counties and delegates who have the general plan already in mind are asked to attend to discuss the reappraisal program beyond their county lines. These men in turn set up active committees which will serve upon the actual appraisal committees and work in conjunction with the staff of the Reappraisal Division of the Colorado State Tax Commission.

The highly important aspect of this method of operation, it seems to me, is the ready acceptance of a program as controversial as taxes always are, by our rural people. I think it should point out the direction of travel that would aid and abet the efficiency and ease of operation of any and all Federal Agencies.

Joint Conference on Land Classification

On July 25 and 26, 1949, a group of men were called together by Clifford H. Stone, Director of the Colorado Water Conservation Board, in an effort to obtain a better understanding among and between the various soils map making and using agencies that work in Colorado.

It had long been recognized that there was considerable overlap in the job of soil inventory that has been done, not only in Colorado but in every other State where this type of work is undertaken. The San Luis Valley of Colorado, for example, is covered in part by at least three overlapping surveys. Recently it has come to be recognized that there is certain basic knowledge about soils, erosion, wind and water hazards and climate factors that have a very direct effect on any type of soil survey, without regard to its eventual use.

With the foregoing as a reason for calling this conference, Judge Stone invited representatives from the following groups: The Bureau of Reclamation,

Colorado A & M College, Executive Office of the Governor, Bureau of the Budget, Colorado Tax Commission, State Agricultural Planning Committee, Bureau of Plant Industries, Soil Conservation Service, Forest Service, Colorado Department of Agriculture, and the Indian Service.

These representatives spent two days in July and, later, two days in October drawing up, after considerable discussion, a memorandum of understanding whereby basic information about soils and influencing factors could be gathered by any of the map-making agencies and made available to the other making or using agencies in order to save time and manpower in the field. It was understood and agreed that some of the services would not gather sufficient information to satisfy the needs of other agencies; however, it was also recognized that in many cases as much as 90% of the field work could be saved in this manner.

Perhaps the most important factor in the entire picture was the establishment, through legislative action of the 37th General Assembly, of a fund of \$10,000.00 to set up a clearing house for the soils information at Colorado A & M College. This central clearing house serves as an information center for all of the agencies signatory to the memorandum agreement.

In general the duty of the clearing house is to relay information about impending soils surveys by the various agencies to other interested parties and to keep on file and available, copies of the maps and field notes obtained through finished surveys.

Colorado has been designated as a test area and at this time the first of the surveys under the new agreement are beginning to operate.

CONSIDERATIONS IN THE VALUATION OF LAND CLASSIFIED ON A PRODUCTIVITY BASIS

W. B. Middlemist, Assistant Director of Appraisals, Colorado Tax Commission

In his paper presented at this conference on June 21, Mr. Stevens of Colorado A & M College, discussed the Colorado Reappraisal program in such detail and with such thoroughness as to leave me little to cover in the way of detailed techniques used in our evaluation of rural land. Certain of the points which he raised in his paper deserve expansion, however, and I should like also to raise issues in regard to general dependence on the property tax as a source of revenue, and to comment on the reasoning which is a necessary precedent to any reappraisal program.

Property Tax as a Source of Revenue

We should bear in mind that the ad valorem tax has declined rapidly during the last fifteen to twenty years as a major source of revenue by the group of state and local governments. In a paper presented to the National Association of Tax Administrators earlier this month in Chattanooga by Dr. James Martin of the University of Kentucky, he stressed the receding importance of the property tax. In support of his thesis, he cited for this general area ratios of state and local property taxes to state income as declining from 15 percent in 1932 to 3 percent in 1949. During the same period, the decline for the United States was from 9.93 percent to 2.92 percent in 1949. Expressed in another way, the ratios in this area of state and local property taxes to state and local total taxes declined from 79.5 percent in 1932 to 43.6 percent in 1949.

What has caused this recession, as it were, in the use of ad valorem revenues? Why have state and local governments turned to other sources of revenues? What role can we, as persons interested in improvement of administration of ad valorem assessment, play both in the improvement of ad valorem administration and existing uses of the ad valorem revenues. To some of these questions, brief answers can be offered. To the others, a number of imponderables arise for consideration, answers to which can lie only in aggressive professional and public interest in local government.

Why Have State and Local Governments Turned to Other Sources of Revenue?

Perhaps of primary importance in this question is the undoubted fact that during the depression of the early 1930's, revenues from property sources were inadequate to meet the needs of an expanding governmental economy. In short, it was mandatory to secure productive revenue sources to enable the development of many governmental programs which were designed to provide employment markets and to encourage the re-entrance of private enterprise into depression-hit industries and businesses. At the same time, many state and some local governments were developing selective excises on specific items, were seeking revenues from many types of business and service licenses, were, in short, expanding their revenue sources to expand governmental expenditures on the state and local level.

What Has Caused the Decline in the Use of Ad Valorem Revenues?

Dr. Martin lists four general categories, all related, all typical of the property tax, all problems of every state represented here. He has suggested (1) bad assessment practices, both in the matter of records and in the matter of individual valuations, (2) a slip-shod attitude on the part of local officialdom, (3) poor assessment ratios, or ratios of assessments sales as measurement of the usual statutory admonition to "true and full cash value" found in most states, and (4) public fear of assessment adjustment as a preliminary to general tax increases. I should like to offer brief comment on each of these points, both to suggest their general applicability and to agree that they by no means are far-fetched.

Bad assessment practices. The range for comment on this item could take much of today in terms of relating personal experiences. In Colorado, for example, upon initiation of our reappraisal program, we found approximately thirty different variations of valuation methods, each variation intended to arrive at correct relative value. We found instances of assessment in counties where there were no maps available to show location of taxable and exempt property, and where particular properties being assessed could not definitely be located. We have found innumerable instances of omission of property from the tax rolls, such omission being in part due to the lack of adequate tax maps, in part to failure of the taxpayer to return his tax schedule, and only occasionally related to deliberate intention.

These examples should not and cannot be limited to Colorado. They are true in many states. The general fault inherent in all bad assessment practices is poor and non-uniform administration--both state and local. With administrative courage and impartiality, no assessor can fail to obtain respect from his jurisdiction, even though he might fall short of his statutory goal of substantial equity of taxation treatment. On the state level, ad valorem tax research, as pioneered by the states of New York and Illinois, can furnish to the state supervisory body the data on which sound decisions and adjustments must be based.

A mandatory part of every assessors office must be tax maps showing every parcel of property within the assessment jurisdiction, whether taxable or exempt. There must be a record showing a physical description of every parcel of property, listing all improvements, their construction, condition, age, and use. Finally, there must be sufficient budget and personnel to permit the assessor to examine new properties and to re-examine existing property in his jurisdiction.

On the state level, continuing examination and research into methods, forms and procedures should be made available to local governments. State Supervisory bodies are able to employ skills and to maintain contacts with other jurisdictions which are financially impossible for local governments. At the same time, the products of these skills and contacts should be in a form adapted to routine administration on the local level.

Local official attitudes. In some sense, I have already referred to slip shod attitudes on the part of local officials when I have mentioned the state of record-keeping in local assessors' offices. In another sense, however, these attitudes toward administration of the ad valorem tax have a considerable influence on the appearance of new sources of revenues. Parking meters, for example, are a clear indication, in most cases, of the failure to have a consistently defined tax base for municipal revenues. This failure to define the tax base with adequate assessments on all taxable property, combined with the undoubtedly current increase in the cost of government, makes it necessary for local governments to seek other methods of financing the services demanded by the citizenry.

Yet the appearance, on the state supervisory level, of technique development which will enable assessors to perform their valuation job more equitably, frequently is greeted with resentment and inertia by local officials. It has seemed to us that state officials owe two general duties to their jobs: that of making the most modern techniques available to local assessors in order that they may perform their duties more efficiently and accurately; and that of assuring the general body of taxpayers-no matter in what jurisdiction they live-that the local officials are performing their duties in accord with constitutional and statutory requirements.

All of you will agree, I feel, that two features of local government may prevent the appearance of well-qualified candidates for office in local governments: that of short terms, which in Colorado are two years, and that of low salaries, which in Colorado for assessors are an average of approximately \$2200 per year. There is no need to elaborate on the question of budget, except to point out that failure of adequate appropriations for any governmental job usually limits the effectiveness of the job.

Poor assessment ratios. As I am sure all of you know, the assessment ratio is a measurement technique employed by most governments and some local governments to measure the degree to which assessors adhere to the "true and full cash value" criterion for assessments. Briefly, the measurement requires the selection of a sample of representative sales in a jurisdiction together with the assessment on that sale. From this information may be computed the ratio of assessment to sale and the expression, usually by the median, of the average ratio for the entire sample in that jurisdiction. If there is substantial equity in assessments within the jurisdiction, the range of ratios away from the median will not be very great. Similarly, if there is substantial equity among counties, there will not be too much variation in the assessment ratios for each county.

In view of these general remarks about assessment ratios, it should be noted that last year in Colorado, assessment ratios for the several counties ranged from a low of about 12 percent to a high of 37 percent, with the average falling at 23.5 percent. Correction from the reappraisal program will not be available until 1951, since the values resultant from the program will not be placed on the tax roll until that time. The problem, then is one of interim correction of values during the course of revaluation. Despite the obvious opportunities available to assessors,

however, I regret to report to you that few, if any, corrections have been made. The cheerful aspect of the project lies in the fact that the properties previously omitted from taxation are being placed on the tax rolls as rapidly as they are being found. In some cases, this is a substantial increase.

In addition to the generally low and highly variable assessment ratios, it is worthy of comment that the Colorado legislature, in its 1949 session, saw fit to pass legislation making an annual assessment ratio study mandatory rather than permissive for the Colorado Tax Commission, made horizontal adjustments mandatory in the case of counties whose average ratio was more than five percent away from that average, and made it mandatory on the State Treasurer to withhold all school aid in the case of those counties who refused to make upward adjustments to the state average ratio. I mention this legislation not because it may be either good or bad law, but rather to illustrate the temper of legislators and the sort of drastic action felt necessary in Colorado to secure assessor compliance with state laws pertinent to assessment levels. In terms of grants-in-aid, which is substantially the character of state school aid, it is apparent that the state governments have a real stake in the adequacy of assessments and the level of taxation being carried on in the counties. Colorado, since it has a state property tax levy assessed on the aggregate value of all taxable property, has a natural history of competitive undervaluation. That is, since the county levies can be adjusted upwards as high as necessary to meet county requirements, the assessments can be kept as low as possible in order to evade the impact of the state levy. This has led as you can imagine, to some nearly impossible situations and to some highly humorous abstracts of assessment. As example, the total value of all taxable property in Colorado in 1946 was 3 percent below the aggregate value of the property in 1913.

The step deemed necessary by the Colorado legislature has been law in Illinois for a number of years. Similar legislation was passed by the California legislature in its last session. The point here is that such definitive requirements is a certain sign, not just of the need for more carefully defined tax bases in the face of mounting costs of government, but even more surely of a loss of patience with the "windshield survey" methods traditionally associated with property tax assessments.

Public fear of assessment adjustment. From the time when we initiated the reappraisal program in Colorado, the accent has been on the factor and the need for equalization of assessments. That is, if the total assessment goes up, the tax rate must go down, providing the amount of money to be raised remains the same. It is amazing how difficult that simple relationship can be to explain. The total budget for a given taxing district is divided by the total assessed value of that district, and the resulting quotient is the taxrate, which then is multiplied by each individual valuation to produce the individual tax bill. Simple as this is, the general public feels that an increase in their individual tax bills can be the only result of reappraisal.

In addition to the explanation of the need for equalization, we have tried to stress the adjustment character of the program. That is, if a given assessment has been too low for a period of time, this program surely will adjust it upward, and conversely, if an assessment has been

too high, it will be lowered. In Colorado, as in other states, there is an elaborate series of tax rate limits and revenue-increase limits which limit the power of the local governmental function to raise the tax bills. For example, the tax rate limits for counties is specified according to total valuation by statute. In these days of revenue requirements increasing faster than value, appeals are made by every county annually to the Tax Commission for authority to exceed their rate limits. In the case of school districts, revenues may not be increased more than 5 percent in excess of that amount raised the previous year.

Inherent in this misunderstanding, which is overcome only by considerable effort, are not the type and kind of comments that we have made, but rather the great need for a thorough public relations program designed to educate the public to the functions performed by their local governments, the amounts of money necessary to perform those functions, and the effectiveness for budget review and control by the electorate.

What can we do to Improve Use of Ad Valorem Revenues?

In the preceding comments, I have made an attempt to suggest some of the interests that we have in an educational program which can effectively employ some of the facts of taxation in calming the fears of the general public. Action in accomplishing education cannot be of the classroom variety, however. It must be on the basis, we believe, of organizational appeal first, and of personal appeal through the medium of organizations. How can this be done?

In Colorado, there are a number of state organizations interested-some impersonally, some selfishly-in the successful completion of a reappraisal program. To the end that they are interested, it has been possible to secure support from these groups, not in terms of legislative support, but in terms of explaining the source of funds which provide local services and the method of distributing the cost of those services to the taxpayers. Such explanations have been passed on, both by word-of-mouth and by written explanations. We have, in effect, an informal speakers bureau. But it should not be necessary to provide a full-blown reappraisal program to secure such education. The Rotary, Kiwanis, Lions, Chamber of Commerce, and many other public-spirited bodies owe themselves and their friends a duty to explain and to help, if you please, the local government with its problems.

That help is the second possibility in improvement of assessment administration through examination of uses of resulting funds. You owe a duty to yourselves to attend the budget hearings of your municipality, your county and your school district to find out how the money will be spent. Certainly the strength of this nation has been the sense of community interest which its citizens possess. That interest should go further than patriotic speeches, and should employ the skills and information in the possession of the citizens themselves.

Apart from this general interest in local uses of revenues is a technical interest which you should employ as assistance to the state and local governments in their administration of ad valorem assessments.

While this interest may take the form of simply examining procedures, it has seemed to us that there is a great amount of specific information which should be tapped to make administration as effective and as fair as possible. I refer to the research programs conducted by the land grant colleges, to the various theses presented in requirements for doctorate studies, to the detailed crop production studies, cost-of-living studies, and all of the examinations which state, Federal and state-Federal projects must make for other purposes. Perhaps a summary of our experience in Colorado will illustrate.

1. Crop production statistics. As a basis in the Colorado reappraisal for the valuation of rural land, we are using the average-per-harvested-acre production for the period 1934 to 1943 to determine the average-gross dollar-per-acre income. As Mr. Stevens has explained, we have developed techniques for assigning values to the various land classes in each county, both dry and irrigated, as well as range land, the summation of which is consistent with the average value for the county. Pertinent, too, is our recognition of the need to continue the use of a long range production period as the basis for farm and range land values. The debate currently on this need is the determination of whether we should have a five, ten, or twenty-year shifting period or average. If the twenty-year period is used, we give importance to production and type of crops no longer of prime importance to the agricultural economy of the state. If the shorter period is used, it may not be sufficiently long to show the long range capabilities of production. The answer, surprisingly enough, probably can be found in the resistance to change which has prompted us to use a pre-war level of valuation rather than present day values. A manifest absurdity, we are living in the present and enjoying incomes in the present. There can be no defensible argument for valuation of property at levels in the past. There is one possible exception to this argument, which I shall mention later.

2. Farmer committee assistance. There can be no permanent success in any program which does not consult informed local opinion. We have consulted a number of farmer committees in the administration of Colorado reappraisal, and plan to continue to do so as we continue. We are fortunate in Colorado to have the cooperation of the State Agricultural Planning Committee, together with its member county planning committees as contact groups in most of the counties. These groups meet in consideration of the problem of valuation, and every fact that we can obtain is brought to their attention, with excellent results, of which Mr. Stevens has told you.

There are two other purposes in establishing and cooperating with these farmer groups, however, which we believe deserves mention. The co-operation of farmer groups not only is a source of local opinion as to relative land and property values, but is a medium through which flows opinions to farmers resident in the county but not members of these planning groups. Second, it is our hope that these committees will remain in close contact with the continuing assessment administration in every county to insure the maintenance of the assessment system we are installing and thus to insure the maintenance of procedures which will aid in retaining maximum assessment equity.

3. Formula refinement. Part of the job of the state supervisory agency is the continued research into methods of valuation which will make the assessors job constantly more accurate and capable of routine administration. To this end, as indicated earlier, a continuing program of securing crop production statistics as they become available, as well as to participate in their analysis, must be a program of the state agency. In the same sense, through the cooperation of farmer committees in every county, the existing formula must be adapted to local situations. We do not come here to suggest that an iron-clad formula can be successfully developed for the valuation of rural land. We feel that any formula must be warped to fit local conditions rather than local conditions to meet a formula. As examples, I would cite the large-scale plow-out of grazing lands in eastern Colorado. In response to farmer committee proposal, we intend, where land classified as suitable for grazing only has been plowed out to crop, to value such land at a figure no lower than that of the lowest grade crop land. As another example, where in irrigated areas land-leveling programs are being carried out to increase productivity and classification, and, as is generally recognized, crop production drops materially for the first three to five years, the land value will remain at that of the original class for that first production period, then advancing to that of the next higher class.

THE MONTANA LAND RECLASSIFICATION PROGRAM

H. R. Stucky, Extension Economist, Montana Extension Service

Taxes on agricultural land are the largest single source of property tax revenue in Montana, accounting for about one-fourth of the total revenue raised by the property tax. In many counties taxes on agricultural land provide more than half of the revenue which is used to support schools and county government. It is important, therefore, that the method of classifying land for assessment purposes be given careful study so that the resulting tax on the land may be made as fair and equitable as possible.

The land classification which is not in effect in most Montana counties was done between 1919 and 1923 under provisions of the 1919 land classification law.

The 1919 classification, which was inequitable at the time it was made, is still in effect in most Montana counties. Few changes have been made which have corrected the original errors. In addition the classification has become more inequitable in many counties by failure to record changes in land use. Some land which has come under irrigation for example still is classed as grazing land or non-irrigated farm land. A considerable acreage of land which is now producing wheat still carries a grazing land classification.

1919 Classification Law

Some of the provisions of the 1919 law are as follows:

1. The State Board of Equalization is required to provide for a general uniform method of classifying land for the purposes of securing an equitable and uniform basis of assessment.
2. The State Board of Equalization is responsible for prescribing maps, plats, and record books for recording the official classification of the county.
3. The County Commissioners are responsible for the classification of all lands in their county.
4. The County Assessor is required to assess all lands for taxation purposes in accordance with the classification as made by the Board of County Commissioners.

In the 1919 law it is recognized that classification and assessment are two separate jobs. Classification is the responsibility of the commissioners. Assessment is the duty of the assessors.

No Uniform Program

The 1919 law did not provide for a uniform method of classification between counties. Each county set up its own classes and grades of land.

Some of these schedules were set up by the land classifiers. Others were set up by the commissioners.

In general, there were no grade definitions set up. Number 1 land on one farm or in one county could not be compared with number 1 land on another farm or in another county. First grade land on one farm or in one county might be 20 bushel wheat land while first grade land on another farm or in another county might not be better than 10 or 12 bushel land.

There were no definitions, of what each grade represented so the farm and ranch operators in most counties have never known the basis on which their land is classified. Because of the lack of uniformity in the classification between counties there can be no equalization between counties under the present system. In many of the counties no one knows at the present time where a copy of the original schedule of grades and classes can be found.

Reclassification Under Way

The County Commissioners in Teton county were first to start reclassifying the land of their county after the 1919 classification was found to be unsatisfactory. Since that time about one-half of the counties of the state have set up reclassification budgets. Some of these budgets were set up for classification of both land and buildings, while other counties are working only on the reclassification of buildings. Several additional counties are setting up budgets this year for the period 1950-51.

Reclassification Defined

In Montana, reclassification of land means placing lands of similar productive capacity and use in the same class and grade. Lands of similar productivity and use have similar ability to pay taxes.

Productivity, Sound Basis

The production of the land is a sound basis for reclassification. The productivity is determined by use of soil maps, yield information and the judgment of the farm and ranch people together with the judgment of those in charge of the classification.

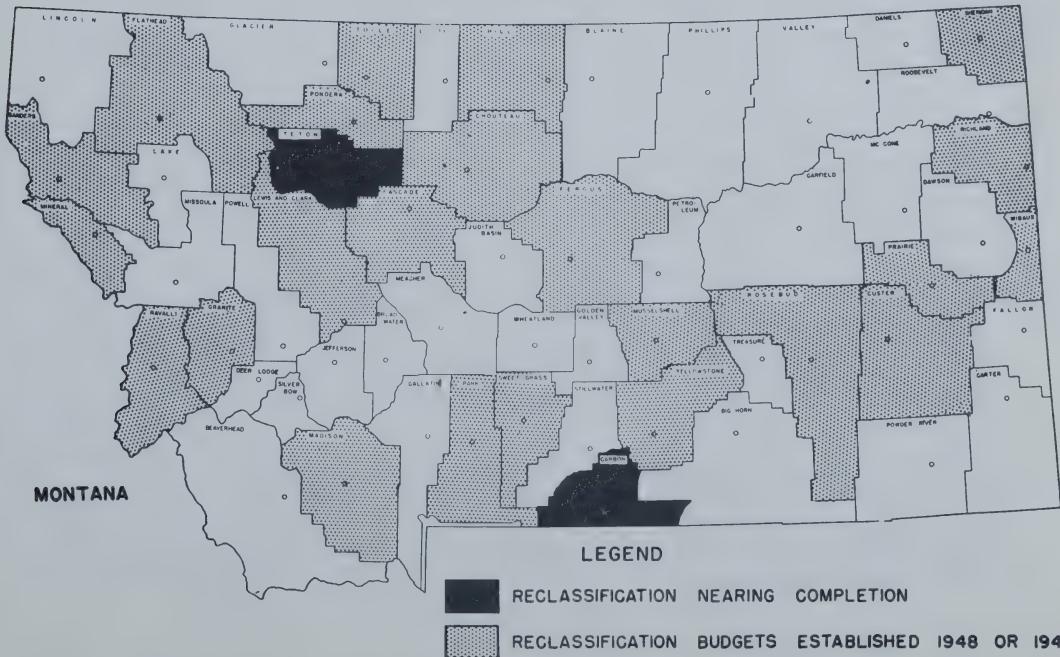
The long-time ability of the land to produce should be the basis for land reclassification. This is true because the long-time productivity of land determines its value for agricultural purposes and its capacity to pay taxes.

Land reclassification should, in general, place each piece of land in a class according to its long-time ability to produce. If this is done, each piece of land will be able to carry its fair share of taxes without throwing increased burden on other agricultural property. The total agricultural property then would be able to carry its fair share of the property tax burden without excessive hardship. Land reclassification should not be used, however, to increase the share of the tax burden carried by agriculture.



Portage Community Agricultural Planning Committee, Cascade County, Montana at work on Land Re-classification. The committee is reviewing soils maps, aerial maps, yield records, and other available information. Seated left to right, Al Evans, A. L. Holtz, Harold Shane, Tom Dailey, and William Neumyer. Standing left to right, William Engstrom in charge of Classification work and Theodore Fosse, County Agent.

MAP OF MONTANA SHOWING STATUS OF AGRICULTURAL LAND RECLASSIFICATION WORK IN 1948 AND 1949



If the land is classified according to its ability to produce, the valuations placed on each class could be changed from time to time in line with changes in economic conditions.

Co-operation Needed

Reclassification of land on a productivity basis requires the co-operation of the people of the county, the County Commissioners, the County Assessor, and the State Board of Equalization.

Experience has shown that the regular county officials working with special deputies or committees can do the work more successfully and with less expense than it can be done under contract. Experience during the period of 1919 to 1923 and in recent years has demonstrated that contract work is expensive. The work done in many counties has not been up to the standard expected at the time the contracts were made.

Local people working with the regular county officials can contribute information which will improve the accuracy of the reclassification. Some of this information may be obtained through community and county planning committees, farm meetings, and contact with individual farmers.

The State Board of Equalization is directed by law to prescribe forms, maps, and records. All work done in the county, therefore, should be done in full co-operation with the state office and appropriate personnel. Soil survey data, aerial maps, experiment station personnel, and soil bulletins should be utilized to the fullest extent.

In proceeding with a reclassification program, the people of the county should be kept informed regarding the proposed reclassification and the progress of the program. This makes it possible for them to co-operate with the commissioners in the work.

Help Available from Montana State College

Montana State College through the Extension Service and Experiment Station has been interested in land reclassification almost from the beginning in 1928. This interest comes from the fact that the County Agents are close to the problems in the county and are called in by the County Commissioners and the people of the county whenever a problem as important as land reclassification is being discussed. This was true in 1928 when Bob Clarkson, County Agent in Teton County, was asked to assist in holding a series of meetings regarding land classification. It was also true in 1950 when several County Agents have assisted the County Commissioners by arranging meetings at which land classification was discussed.

The Agricultural Experiment Station through the Department of Agronomy and Soils began making soil surveys in the early 20's. By 1930 several counties had been covered with these soil surveys. In 1930 the County Commissioners and County officials in Teton County found that the soil survey was a good guide to land classification. Since that time

the Experiment Station and members of the Extension Service have assisted County officials and the farm operators in converting soils information over to productivity classes.

The Montana Extension Service and the Montana Agricultural Experiment Station are not promoting the reclassification of land for tax purposes in Montana. They are willing, however, to assist County and State officials in any way possible in interpreting the soil surveys, economic data and other studies which will assist the counties in reclassification work. The County Agent can assist the County Commissioners in the counties in holding meetings. We at the college have prepared two publications as a result of studies on the methods of land classification. The first of these is a bulletin entitled, "Procedure for Land Reclassification in Montana." This bulletin explains in detail the procedures being used in a number of counties. An Extension circular No. 204 is a brief review of the bulletin. The bulletin was prepared for use of County Committees, County Commissioners, and others interested in the details of land classification. The Extension circular was prepared for general distribution throughout the state and is generally used by County Agents and others in community meetings with farmers and ranchers.

Other Assistance Available

The Soil Conservation Service, Production Marketing Administration, Forest Service, Rural Electrification Administration, Farm Credit Administration and Farmers Home Administration all have information which may be made available in this work. The representatives of these organizations in the county very often act as advisors with the County Extension Agents in working with Community and County Planning Committees on land classification work.

The Montana Method of Land Reclassification

The Montana method of land reclassification has been developed over the past 20 years. It is based on the use of soil surveys where available, yield information and the cooperation of farm people. This soil survey work not only forms the basis for an equitable classification within the county but also forms the basis for a uniform classification throughout the state.

Yield records are available from various sources which indicate the production of the land. By using the yield over about 20 years you will include both high and low yield periods. This will prevent getting the high yields of recent years used as the only basis for classification.

Farm and ranch people know their areas better than anyone else could possibly know them. By using the soil survey information as a basis where available, and using yield records as a guide to supplement the soil surveys, farm people can help a lot in this classification of land according to the ability of the land to produce.

Aerial Pictures

Aerial pictures should be used as a basis for locating the fields and streams and roads and other features. New aerial pictures were made in about 10 counties last year and 8 or 10 more counties are being flown this year. These aerial pictures will save many dollars in this work if properly used in making up the land classification maps.

The Organization for Land Classification

County Commissioners in Charge - The County Commissioners are responsible under state law for the reclassification job. They might select one person to work under their supervision to lead the actual classification work.

Community Meetings - The County Agent, at the request of the County Commissioners, might arrange community meetings at which the County Commissioners, County Assessors and the County Agent and other might explain the method of reclassification.

State Program - Under present law it is the duty of the State Board of Equalization to establish procedures for classification. They have, during the past few years, set up a standard schedule of classes and grades. This schedule has been developed over the past 20 years as a result of experiences in the various counties. It is based on the soil surveys and on yield per acre.* The grades of tillable irrigated land are based on the tons of alfalfa produced per acre. Non-irrigated farm land grades are based on the bushels of wheat produced per acre. Grades of grazing land are based on the Animal Unit carrying capacity of the land.

Selecting the Sample Areas - Three to six townships are selected as sample areas. These townships are selected by the people in the county as representative of all of the major types of farming in the county. Each of these townships is classified on yield basis. Grades are established on each piece of land according to the state schedule. When each of the townships has been classified, Community and County Planning Committees together with the county officials and the people in each of the counties check them over thoroughly. The sample townships should also be re-checked by soils men from the college, the Soil Conservation Service and others to be sure that each township is graded in line with the soils information available. After these sample townships have been re-checked they should be approved by the County Commissioners as being satisfactory and in balance with each other. These sample areas would then be used as a guide in completing the rest of the county.

The use of the sample townships has the advantage of doing the preliminary work on relatively small areas. The method of classification, the grades for the county, and the educational programs will be well worked out before the rest of the county is completed. This will prevent many costly errors in comparison with doing the county without having the sample areas checked and approved by all people concerned.

Cooperation of Farmers and Ranchers

A general understanding of the needs on the basis for reclassification is essential to obtain the interest and cooperation of the people in the county. This is the reason why the preliminary community meetings are held where the County Commissioners, the Assessor and other officials can explain the proposed program.

County Agricultural Planning Committees are now organized in many counties in Montana. These County and Community Planning Committees have been a good assistance in this work. These groups can help arrange for education meetings and they can also help in the actual classification and re-checking of the classification.

Where no County Agricultural Planning Committees exist one might be organized to assist with the land classification work.

State Program Necessary

It is necessary that each county doing the land reclassification work should follow the state schedule classes and grades. This will result in all land having the similar producing ability in the state being placed in the same grade. That is, land which will produce 16 bushels of wheat per acre in one county would be in the same grade as 16 bushel land in all other counties of the state.

This is very similar to what we have now with the classification of livestock. Everyone recognizes that a two year old cow has about the same value in any county in Montana. For that reason two year old cows are assessed at about the same price in every county in Montana.

So, with the same basis, 16 bushel farm land or grazing land which will run 20 head per section in the state, has about the same value and should carry about the same value in each county wherever 16 bushel farm land or grazing land which will run 20 head per section, is found in the state.

New State Schedule

The State Board of Equalization has set up a schedule of classes and grades of land to be used in all counties which are re-classifying land. Use of this schedule is required by the board under its authority to "provide for a general and uniform method of classifying land" as specified in the classification law.

The following schedule was approved by the Board of Equalization and sent to the County Commissioners and County Assessors with a letter under date of December 28, 1948:

CLASSES AND GRADES FOR
MONTANA AGRICULTURAL LAND CLASSIFICATION*

<u>Tillable irrigated land</u>	<u>Tons of Alfalfa per acre</u>
Grade	
1A	4.5 and over
1B	4.0 - 4.4
2	3.5 - 3.9
3	3.0 - 3.4
4	2.5 - 2.9
5	2.0 - 2.4
6	1.5 - 1.9
7	1.0 - 1.4
8	Less than 1.0
<u>Nonirrigated farm land</u>	<u>Bu. Wheat per acre on summer fallow</u>
Grade	
1A	24 and over
1B	22 - 23
2A	20 - 21
2B	18 - 19
2C	16 - 17
2A	14 - 15
3B	12 - 13
4A	10 - 11
4B	8 - 9
5	Under 8
<u>Mixed hay or wild hay land</u>	<u>Tons of hay per acre</u>
Grade	
1	3.0 and over
2	2.5 - 2.9
3	2.0 - 2.4
4	1.5 - 1.9
5	1.0 - 1.4
6	.5 - .9
7	Less than .5
<u>Grazing land</u>	<u>Acres for 10 months grazing season per 1000 lb. steer or equivalent</u>
Grade	
1A	10 acres and under
1B	11 - 18 acres
2A	19 - 21 acres
2B	22 - 27 acres
3	28 - 37 acres
4	38 - 55 acres
5	56 - 99 acres
6	100 acres and over

*A special schedule of grades has been established to apply to the non-irrigated lands which will produce high yields of wheat and also which will consistently produce good yields of potatoes, peas, and alfalfa or red clover. Most of such land in Montana is located in Flathead County.

This schedule has also been adopted by the State Association of County Assessors and has been discussed in several of the recent meetings of the State Association of County Commissioners.

In applying the state schedule three sources of information are used:

1. Soil Surveys

The Montana Agricultural Experiment Station at Montana State College in cooperation with the U. S. Bureau of Soils has completed soil surveys in about 2/3 of the counties in Montana. Additional areas have been surveyed in cooperation with the Soil Conservation Service.

These soil surveys are reported in soils bulletins which give the characteristics of the soil including the general crops grown and the probable crop or grass yields. The Agronomy Department and Agricultural Economics Department of the Experiment Station together with the Extension Specialists have rated the soil types according to yields. These ratings in the last couple years have been made on the same yield basis as the schedule above. Before that time the dry farm land was put into four grades, grazing land into five grades and irrigated land into three grades. These older ratings are being sub-divided to correspond with the land classification grades in the counties where land classification has begun.

The land use capability surveys of the Soil Conservation Service are being used where the work has been done by their soils technicians, and where the type of soil is indicated on the maps. These soils as shown in the soil conservation survey maps are rated in the same way that the soils shown in the college surveys are rated.

2. Aerial Pictures

Aerial pictures are used wherever available for developing base maps, locating field boundaries, and other details. The most useable are those that are 4 inches per mile, so the township maps which are also 4 inches to the mile can be made directly from the aerial pictures with some minor adjustments due to distortion in the pictures.

3. Township Maps

By making township maps from aerial pictures it is possible to work faster and more accurately than it is to work each section at a time, as was done in the 1919-1923 classification. Soil types, field boundaries and farm ownership frequently extend across section lines. By using township plats it is possible to make comparisons between soils

and productivity much more easily especially since the community committees are assisting in the classification work. Committee members can see their farms and the neighbors land in relation to each other. When classifying the land they can also use the aerial pictures to call their attention to surface features which they might not remember without referring to the picture.

Reclassification Procedure

The procedure for land reclassification is reviewed briefly as follows:

1. The County Commissioners decide to reclassify the real estate of the county and set up a budget for that purpose.
2. The reclassification is discussed at community and county meetings of farmers, stockmen and people from the various groups in the cities and towns.
3. For the classification of farm land it is necessary that farm people be familiar with the program and assist in establishing the classification on the land.
4. Three to six townships are selected in the county to serve as sample areas. Each of the townships is selected to represent a certain type of farming in the county. Enough townships, between three and six, to represent all of the major types of farming in the county.
5. Soil maps, yield records and other information are gathered for use on these sample townships.
6. Base maps are made on transparent tracing paper from the aerial pictures. All 36 sections of the township are included on the same map. Copies of these township maps made on transparent tracing paper can be printed whenever desirable.
7. Community committees assist in the classification of each of the sample townships. Aerial pictures, soil surveys, yield records, and the judgment of the farm and ranch operators are combined in placing the grade on each piece of land.
8. Each of the sample townships is checked in the field by the person in charge of the classification, soil specialists, community committees and county officials. This is to insure that a good job of classification has been done in each township.
9. These townships are brought together. A meeting of the county agricultural planning committees and other interested groups is called by the County Commissioners to go over each of the townships. This is to be sure that each of the townships is graded in the proper class and grade in comparison with all other townships.

10. The County Commissioners approve the sample townships and they are then used as guides in reclassifying the other townships in the county.

The farm and ranch people by taking an active part in the classification can assist in getting a good job of classification in the county. Their assistance in this work will also save them as taxpayers of the state a large amount of money. The amount of time that any one operator will be required to spend will not be large. The total amount of all of the help given will be invaluable in the success of the program not only financially, but in getting a fair and equitable classification of the land.

The strong and weak points of the reclassification program in Montana might be summarized as follows:

Strong Points

1. Wide Spread Cooperation - There is wide spread cooperation between the, State Board of Equalization, State County Commissioners Association, State County Assessors Association, Montana Taxpayers Association, Farm organizations and growers associations, and Montana State College, Experiment Station and Extension Service.

2. Long Historical Background - There is a long historical background for the reclassification. The first work was done in 1928. Several other counties had started work by 1941. About 1/2 of the counties now have made a start toward reclassification.

3. Continuing Interest - Through much of this period there has been a continuing interest on the part of several people. For example, Otto Wagnild, now fieldman for the State Board of Equalization, was County Treasurer in 1928, when the first county started work.

4. Basic Data - In Montana, soils surveys maps have been used to make up productivity maps since 1930. These maps have been checked by farmers, bankers, and others, and they have confidence in these productivity maps as a general guide in the program. The State and County land use planning committees have also developed considerable information which is of value in this work.

5. The present procedure for the classification of land has been developing since 1930. This has allowed for a gradual development through study and use of the procedure.

6. No state law requiring reclassification has been in force. This has allowed for gradual development. This appears to have been an advantage up to this time. Passage of a state-wide law requiring reclassification within a 4 or 6 year period now seems advisable.

Weak Parts

1. The Montana State Board of Equalization lacks money for supervision of the state reclassification program.

2. The present state classification law should be clarified. A new law which would re-state the duties and obligations might correct this.

3. Several counties do not have aerial pictures, and several do not have soils surveys available.

4. The assessors do not have enough funds available to hire competent assistants to make the change in the classification.

The assessors are not required by law to use the reclassification of buildings even if the County Commissioners have the buildings reclassified. This fact delays land classification work, because the classification of both the land and the improvements should be brought up to date.

6. No state program of training assessors, County Commissioners, and reclassification officials is now in operation in Montana. This is badly needed to give these people the assistance they need to do a satisfactory job. A more uniform job would result if a training program were in effect.

STATE PROGRAM FOR REAPPRAISAL OF FARM AND GRAZING LANDS
IN MONTANA

Otto Wagnild, Field Supervisor, State Board of Equalization

The equalization of real estate assessments in Montana is largely one of properly classifying farm and grazing lands. As a first step in this direction the legislature in 1919 enacted a law requiring county commissioners to classify the lands in their respective counties, for the purposes for which they were valuable, with the idea of "securing an equitable and uniform basis of assessment." While the state-wide classification made under this law resulted in some improvement, it was unscientific and unsatisfactory. Good work was done in a few counties, but in many it was evidently performed on horseback, and in some the principal equipment must have consisted of a high-power telescope. However, the classification was subject to revision by the county commissioners upon application of individual taxpayers, so over a period of years the situation improved to some extent.

About the time the counties began classifying under the 1919 law, the Montana State College entered upon a soil survey program, classifying according to soil formation and productivity, and preparing soil maps as the work progressed. It was not until the early 30's, however, that these maps were used for classification purposes.

Before lands can be graded in terms of productivity it is necessary to determine the use or uses for which they are adapted. Grades of lands are determined by their productivity within a use classification. In actual practice it is convenient to group lands with various yields into grades denoting various production ranges. The State Board of Equalization, with the assistance of the State College, has prepared a schedule for use in determining the various grades. For example, "first grade" irrigated land would indicate a yield of four tons and over of alfalfa per acre. First grade non-irrigated farm land would indicate a yield of twenty-four bushels of wheat and over on summer fallow, and first class grazing is land which requires ten acres or less for a 1,000 pound steer for a ten months grazing season.

A great deal of educational work is required to successfully initiate a program of this kind. The cooperation of taxpayers and county officials is essential; and that cooperation is best obtained when it is explained that the program is one of equalization only. In order to obtain uniformity throughout the state the classification is made under the supervision of the State Board of Equalization.

Even where detailed soil surveys are available local judgment is important in determining the productivity of different soil types. If lands are classified and graded without soil surveys, then local opinion becomes an even more important factor. Use of the farmer judgment in classifying lands necessitates a medium for bringing farmers together to study available information and crystalize local opinion. This medium is the local planning board and other farm organizations.

To initiate the program the county commissioners appoint one man to be in charge of this work for them or a board of appraisers composed of three members, who have charge of the work. This board prepared township maps showing the grades in each forty-acre tract. When these maps are completed within the county, the board calls community meetings of farmers and stockmen, who review the work and recommend necessary changes. This procedure has proven very satisfactory.

The revised maps are then submitted to the county commissioners and county assessor for final approval. With the lands thus graded uniformly according to soil type and production in all counties it will be possible to equalize the valuation between counties.

State Board of Equalization Authority

Because the people of Montana were particularly concerned about a method of equalizing the amount of tax contributions which were made on equal classes of property, the people of the state approved an article to the state constitution authorizing the formation of a State Board of Equalization to perform this task. In essence this board has the authority to do all things necessary to secure a fair, just and equitable valuation of all taxable property among counties, between the different classes of property and between individual taxpayers. This places upon the state board far-reaching powers in matters relating to taxation, but a restriction is also apparent, in that this board shall not intentionally discriminate in favor of one party as against another, whether it be county or individual in nature.

County Commissioner Authority

The problem of classification and valuation is a county problem. The Board of County Commissioners in a county is authorized by State law to place a levy on a taxable property to meet the expenses necessary to get the job done. The Board of County Commissioners has legal authority to employ experts for the purpose of reclassification, reappraisal and revaluation of taxable property, may at their discretion select any appropriate mode or course of procedure, and this authority so conferred finds roots in the State Constitution itself.

The Levy to Raise Money

The question may arise as to whether or not there is any limitation upon the levy that may be made for purpose of revaluation. Yes they are limited by state law to a levy not to exceed sixteen mills on each dollar of the assessed valuation for any one year. This is a definite limitation and if it follows that this amount is insufficient to take care of the project of revaluation, then another method must be used for raising the additional fund. Other limitations on amount which can be levied and used for purposes of revaluation can be found in the Montana Constitution and Revised Codes, 1935.

LAND CLASSIFICATION CONFERENCE

Great Falls, Montana

June 21-24, 1950

Report prepared by R. F. Rasmussen, Hill County Extension Agent, and Allan Hanson, Hill County Land Classifier.

Hill County is located in North central Montana and is approximately 100 miles north and east of Great Falls. The county includes about 1,900,000 acres, of which 850,000 is agricultural land. The balance of the land in the county, or about 1,000,000 acres, is grazing land. The Rocky Boys' Indian Reservation is located in the Bear Paw Mountains in the southeastern corner of the county.

Early Classification

The land classification system which is being used in Hill County at the present time was established during the early 1920's. This classification was made by local men and apparently most of the work was done from the highest evaluation in the community being classified. Surface features were the most important factor considered in making the classification. No soil tests were made and the productivity of the land was not considered. There was no standardization between counties as far as the classification of land was concerned. The distance from market was a factor that influenced the classification of land as well as the topography. The original classification made during the early '20s is still being used and it has not been changed unless farmers have made specific requests for a change. In many instances land is classed as grazing land even though it has been farmed for many years.

Tax History

The tax history for Hill County is similar to the tax history of the State of Montana. In 1933 about 53% of the agricultural land in Hill County was on the tax delinquent list. This included over 800,000 acres of land. During the same year about 45% of the agricultural land in the State of Montana was on the tax delinquent list. The reason for this high rate of delinquency in Hill County was probably caused to a large extent by the improper classification of land for taxation purposes. As a result, taxes on land of poor quality were not paid, which in turn caused an increase in the taxes levied on good land and on personal property. Adverse economic conditions together with a series of unfavorable crop years also contributed to the amount of tax delinquent land.

Need for Reclassification

The need for a revision of the land classification system for taxation purposes was clearly evident. During the middle '30s some effort was made to do some work on the reclassification of land in many counties in the state. This work was not designed primarily for use in connection with the taxation of land but it has been of value where the job of classification for taxation purposes has been undertaken. The job of classifying

the land during the middle '30s was carried out by Agricultural Planning Committees. Counties doing this reclassification were organized on a community basis, each community having an Agricultural Planning Committee. These committees mapped each township in their community, classifying the land as to its present use and making recommendations as to its classification and future use. These committees worked with the County Extension Service in doing the job of classification. They used productivity information obtained from the AAA office, aerial photographs and soil classification maps where these were available. In most instances, the actual mapping job was done by employees of the Work Production Administration. The job done at that time is of considerable value for reference in completing the present reclassification of land.

Start in 1948

The decision to start the reclassification of land for taxation purposes was made in 1948. The information concerning land reclassification which was supplied by the Extension Service and other departments of Montana State College was an important factor in making this decision. A meeting of the County Commissioners held in Bozeman, at which time the land classification process was discussed, was also a factor in increasing interest in land reclassification. The fact that the State Board of Equalization has accepted the land classes and grades which are being used for reclassification of land in the various counties of Montana has been an influence in causing Hill County to be interested in the reclassification of its land. Money for financing the reclassification process in this county is derived from a one mill levy. The tax was first levied in 1948 and 1949. It was levied last year and will be needed until the job of reclassification is completed.

Soil and Other Information Used

In reclassifying the land in Hill County, the first step is to check existing information on the land. The soil survey maps are the basis for the work, other information includes the old land use maps which were previously described, the aerial photographs, the information available through the Production and Marketing Administration, information obtained from the Hill County Soil Conservation District, and the classification maps now being used for taxation purposes. An outline map of the area to be reclassified is made on a scale of four inches to a mile. This is made on tracing cloth.

Aerial Photographs

Aerial photographs made on a scale of four inches to the mile are available and are used to locate the various topographic features as well as field boundaries and in many instances different land classes. By placing the aerial photographs beneath the tracing cloth, information desired can be traced on the outline map being prepared. By using the other information that is available, a map which is quite accurate as far as soil classes are concerned can be constructed before any field

examination of the area is undertaken. This map is used when field trips are made to check on the actual classification of the soil. Since this outline map is made with pencil, it can be changed easily. When the map has been checked in the field, it is ready for duplication. An arrangement has been made whereby these maps are duplicated by the City of Havre, the only cost being the cost of the materials involved. These maps are made on a township basis and a few copies are reproduced after the field check has been completed.

Committees

The township maps as reproduced will be used as work sheets in making a final check on the accuracy of the classification. This will be done by committees representing the area reclassified. In most instances, these committees will represent one township. In some parts of the county the committees will handle more than one township, due to the fact that very few farm operators reside in the area involved. All reclassification maps will be checked for accuracy by the farmer committees, and corrections in classification will be made on the original tracings. It is believed that after this rechecking process has been completed, the map will be ready for presentation to the Board of County Commissioners and the State Board of Equalization.

Classification Separate From Values

In the entire reclassification process, as it is being carried on at the present time, no attempt is being made to attach any value to the reclassified lands or to consider assessed values in making the classification. In fact, a special effort is being made to complete the reclassification of Hill County lands without paying any attention to assessed valuations. It is thought that a much better job of reclassifying the lands in this county will be done if no attention is given to assessed valuations in connection with the reclassification process.

Reaction of People

The reaction of the people to the reclassification process has been satisfactory in most respects. Land owners have reacted favorably in almost all instances if they understand what is being done. They highly approve the use of the maps made during the middle '30s in connection with the present reclassification job. The final checking of the reclassification maps has not started, but no difficulty in checking the maps is anticipated.

Farm Improvements

At the present time the checking of land improvements in rural areas in the county is being carried out by the local land reclassifier. It has been found that many discrepancies exist in the listing of farm buildings and in their valuation. An attempt is being made to complete a check of farm buildings in the county so that this information will be available for assessment purposes during 1951. All buildings in cities

and towns in the county are being checked and valued at the same time. The town and city job has been let out on contract and is being done by a commercial concern. The local reclassifier has worked with the concern valuing city property and is using the same system in valuing property located in rural areas.

We believe that the reclassification of lands in Hill County is progressing in a very satisfactory manner. We feel sure that the land owners of Hill County will benefit by this reclassification process by having their land assessed according to its ability to produce. The county will also benefit by the reclassification process by keeping the land in the county under private ownership, thereby keeping it on the tax rolls. The cost of doing this reclassification job will probably be insignificant in comparison to the savings that will be realized by land owners in the county and by the county itself.

Allan Hanson
Hill County Land Classifier

R. F. Rasmussen
Hill County Extension Agent

REPORT ON THE RECLASSIFICATION WORK IN CASCADE COUNTY, MONTANA

Theodore Fosse, Cascade County Agent and Harold Shane Chairman, Portage Community Agricultural Planning Committee, Cascade County

Cascade County lands were classified for tax purposes under the 1919-1923 classification program. The work was done under contract. The contractor was a young engineer, from the extreme eastern part of the United States who had no knowledge of the Montana conditions. He did a good mapping job but the grades placed on the land had little if any relation to the productivity of the land. The result was a poor relationship between the taxes assessed and the ability of the land to pay taxes.

The buildings in Cascade County have never been classified for tax purposes. Each property was valued and placed on the assessment rolls in direct relation to the building permit. Builders soon found that it paid well in reduced taxes to place low values on the building permit.

The present Board of County Commissioners were aware of the situation and felt that something should be done. The reclassification problem was discussed at the State County Commissioners Association meeting and with the State Board of Equalization. A meeting of 20 counties interested in land reclassification was held at Montana State College in December, 1948 to discuss the entire reclassification procedure, including the use of soils maps, aerial pictures and township plats. How to get organized to do reclassification work was also discussed in detail.

Following the meeting they discussed the problem further with the State Board of Equalization and decided to set up a budget. A man was hired to head up the work for the Commissioners. This man was better trained for building classification and started on that phase of the work.

The County Agent was called in on the land classification work. A conference was arranged with the Commissioners, L. F. Gieseke, in charge of Soils Surveys for Montana State College, H. R. Stucky, Extension Economist, and Otto Wagnild, Fieldman for the State Board of Equalization, three or four leading farmers and the County Agent attending. This group drew up tentative procedures to be followed in the county.

General County Meeting

The County Commissioners asked the County Agent to call a general county meeting of farmers and ranchers to talk over the program. About 200 people attended. The farm operators agreed that something should be done and that they would be willing to help if they were asked to do so. They were however much opposed to having the commissioners contract the classification work as was originally done.

Community Committees Elected

The County Agent was asked to assist in holding community meetings at which one member of the Board of County Commissioners explained their

proposed action. At each of the 14 community meetings, committees were elected.

These committees were elected to represent all areas of the county and to assist the county officials in the educational and in the actual classification work.

Sample Townships Selected

Six townships were selected by the commissioners and checked by community and county groups. Within these townships were located the lowest and highest yielding wheat land, irrigated land and grazing land in the county. They were also distributed to represent the high foot hill type, level wheat land areas, mixed wheat and range livestock and range livestock sections of the county.

Community Committees Help

The Community Committees assisted the county officials in placing the class and grade of land on each of the sample townships. The Montana law required that each 40 acre tract or a portion of a 40 acres be graded. This is to allow for transfer of land through sale or purchase by 40 acre tracts from one farm to another without requiring the assessors to classify the land being transferred. Each 40 acre tract would carry its own individual class and grade.

The farm and ranch operators on the committees know the relative yields of each farm or ranch in their area. They may know in general that there are differences in soils. With their knowledge of farming practices and yield histories they can assist in setting the land grades. The person in charge of the classification, the County Commissioners, and the County Agent together with help from the soils men of the Montana Agricultural Experiment Station and the Soil Conservation Service can adjust the information from the ranchers to check with soil types and yield information. The State Board of Equalization, the State soils men and the State College Experiment Station and Extension Service personnel can assist each county to start their land grades in proper relation to similar areas in other parts of Montana.

Re-Checking Necessary

In Cascade County, five of the six sample townships have been graded by the community committees. It is now necessary to field check each of these townships to make corrections within the township.

When all 6 have been graded by the County Committees and field checked, these 6 will be checked jointly by the Board of County Commissioners, the State Board of Equalization and the County Agricultural Planning Committees.

This re-checking will assure that similar land in one township will be graded in a similar manner to that in the other areas. When these

sample townships are finally approved by the Board of County Commissioners and the County Agricultural Planning Committee they will be used as guides for completing the land classification in the balance of the county.

Conference Tour

A tour over the Portage Community was conducted to show the conference group the land which had been placed in the various grades by the Portage Community Committee. County Agent, Theodore Fosse, conducted the tour. Harold Shane, Chairman of the Community Committee and L. A. Holtz, a member of the committee explained their reasons for the land grades. L. F. Giesecker, in charge of Soils Surveys, Montana Agricultural Experiment Station and B. H. Williams, Field Inspector for Montana and Colorado, Division of Soil Surveys, U.S.D.A., checked the soils and explained the reasons for differences in yields in different soil types.

The Community Committee had not had time to re-check the township themselves at the time of the tour. Mr. Shane suggested some changes the committee would want to make. The classification made by the committee in its preliminary form, showed that the committee had done a good job of classifying the township, based on their judgment plus soils survey information.

WHAT TO CONSIDER IN VALUATION OF FARM BUILDINGS
IN RELATIONSHIP TO THE CLASSIFICATION
AND VALUATION OF LAND

Vern Englehorn, Doane Agricultural Service, Ames, Iowa

An appraisal is an opinion of value based on facts. A good appraisal is a step by step analysis of the property that shows the consideration given by the appraiser to all detailed facts that have an effect on the value of the property being appraised.

Value is determined by:

1. Human needs.
2. Human desires.
3. Human purchasing power.

Sources of value are:

1. Income capitalized.
2. Replacement cost less observed depreciation and obsolescence.
3. Sales history.
4. Comparative value.

Under the American Rural Appraisal System, in which value is determined by the Income Capitalization method, the farm buildings are set into the appraisal apart from the calculations previously shown and each building is described as to dimensions, foundation, type of construction, etc. A controversy exists as to whether the final building value should be added to or subtracted from the basic value. Most hold that income from pasture and building rent, and cost against them is shown in taxes, maintenance, and insurance, and hence they are fully accounted for in the final basic value.

For the good appraiser, no problem lies in determining the structural value of farm buildings. Several methods are used with "cubing" probably being the most common, using tables as a guide. Some use the square foot method and others the perimeter divided into the total cubic feet. The latter is most accurate. One can estimate the cost of parts of a building also and thus arrive at the replacement cost. Many appraisers use the comparison method knowing the actual cost of many buildings.

Most appraisals of buildings for tax equalization purposes today involve reducing present values to pre-war figures. The common practice is to collect pre-war labor and material costs and from them arrive at a replacement value. It has been found, through experience, that it is best to use present day values arriving at the figures by using actual costs and present methods of construction and proper relationship of material and labor. Then by using construction cost indexes for the area, move the final value into whatever period of years the county, city or state prefers to use for a level of value.

The normal value of a building is reconstruction cost less observed depreciation and obsolescence. Depreciation is a lessening of value resulting from the normal breaking down of material due to decay. Obsolescence

is loss of demand for the use of a building in terms of the purpose for which it was originally constructed, this loss of demand being primarily due to technological advancements in farming methods.

Many times, additional depreciation is necessarily applied to buildings which is called functional depreciation. This is especially applicable to the over improved farm, the highly modern farm dwelling, the large dairy barn in an area where dairying is not typical, and buildings seldom used such as silos in the Great Plains area. The building may not be obsolete in the least but still be out of place as to location.

In urban appraisal the greater portion of value invariably lies in the structure. If it were possible to separate the value of the building from the lot, the value of the lot would be minor. On farm property the value of buildings in relation to the value of land is of minor consideration. The difference in value between a \$2,000 house and a \$20,000 house on otherwise identically well balanced farms is never likely to be fully reflected in the sales value. Thus a functional depreciation applied to farm dwellings is justified, the amount depending on the location, size and type of operation of the farm as well as such facts as the average standard of living in the community.

In as much as most state laws require listing the value of buildings separately from the value of the land, desirable relationship guides are often set up. For instance, the average 160 acre corn belt farm where the corn yield averages 50 bushels per acre, should have (for illustration purposes) an average of \$95.00 per acre on the land and \$30.00 per acre on the buildings. On more valuable land it is logical that the farm could handle more valuable buildings. A smaller farm could stand more per acre value in buildings and on a larger farm the per acre value applied to the buildings would average less. Thus functional depreciation is put into proper use.

Thus the final total value placed on the buildings in an appraisal for tax equalization purposes depends on such factors as: the value of the land, size of farm, type of farming, location, standard of living in the community, etc. The final answer lying in the opinion of the appraiser as to whether the total value of land and buildings puts the farm in question in its proper niche in the scale of values in comparison to the other farms in the taxing district, the county and even throughout the state.

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